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OF

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VOL. XXX.

FOR THE YEAR 1888.

WITH A LIST OF OFFICERS, FELLOWS, ETC.

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PERCY BOULTON, M.D., SENIOR SECRETARY,
AND
F. H. CHAMPNEYS, M.D.

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1871 KEILLER, ALEXANDER, M.D., F.R.S. Ed., Physician to the Royal Maternity Hospital, Lecturer on Midwifery and Diseases of Women and Children at Surgeons' Hall, Edinburgh; 21, Queen Street, Edinburgh.

1871 KIDD, GEORGE H., M.D., F.R.C.S.I., Obstetrical Surgeon to the Coombe Lying-in Hospital; 30, Merrion square south, Dublin.

1870 WEST, CHARLES, M.D., F.R.C.P., Corresponding Member of the Academy of Medicine of Paris; 55, Harley street, W. *Pres.* 1877-8.

FOREIGN SUBJECTS.

1872 BARKER, FORDYCE, M.D., Professor of Clinical Midwifery and Diseases of Women at the Bellevue Hospital Medical College, and Obstetric Physician to the Bellevue Hospital; 85, Madison avenue, New York.

1863 BRAUN, CARL, M.D., Professor of Midwifery, Vienna.

1863 FAYE, F. C., M.D., Professor of Midwifery in the University of Christiania.

1866 HUGENBERGER, THEODOR, M.D., à la Maternité et aux Enfants Trouvés Hôpital des Accouchements, Moscow.

1866 LAZAREWITCH, J., M.D., Kharkoff, Russia. *Trans.* 3.

1864 PAJOT, CH. M.D., late Professor of Midwifery to the Faculty of Medicine, Paris.

1862 SCANZONI, F. W. VON, M.D., Professor of Midwifery, Würzburg.

1877 STOLTZ, Professor, M.D. Nancy.

1872 THOMAS, T. GAILLARD, M.D., Professor of Obstetrics in the College of Physicians and Surgeons; 296, Fifth avenue, New York.

1862 VIRCHOW, RUDOLF, M.D., Professor of Pathological Anatomy in the University of Berlin.

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1873 MARTIN, A. E., M.D., Berlin. *Trans.* 1.

1876 BUDIN, P., M.D., 129, Boulevard St. Germain, Paris. *Trans.* 1.

1876 CHADWICK, JAMES R., M.A., M.D., Physician for Diseases of Women, Boston City Hospital; Clarendon street, Boston, Massachusetts, U.S.

1877 GOODELL, WILLIAM, A.M., M.D., Professor of Gynæcology in the University of Pennsylvania; 1418, Spruce Street, Philadelphia, Pennsylvania.

1876 LUSK, WILLIAM THOMPSON, M.D., Professor of Obstetrics, Bellevue Hospital Medical College; New York.

1876 PREVÔT, OSCAR, M.D., Moscow.

1877 STORER, HORATIO R., M.D., Newport, Rhode Island, U.S.A.

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1889.

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1887 ALEXANDER, SIDNEY R., M.B. Lond., Essex Lodge, Upper Norwood, S.E.

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1873 ALLEN, HENRY MARCUS, F.R.C.P. Ed., 20, Regency square, Brighton.

1887 AMBROSE, ROBERT, B.A., L.R.C.P. & S. Ed., 1, Mount place, Whitechapel road, E.

1878 ANDERSON, IZETT WILLIAM, M.D., 95, Duke street, Kingston, Jamaica. *Trans.* 1. *Hon. Loc. Sec.*

1875 ANDERSON, JOHN FORD, M.D., C.M., 1, Buckland crescent, Belsize park, N.W. *Council*, 1882.

1866 ANDREWS, HENRY CHARLES, M.D., 11, Addison terrace, Notting Hill, W. *Council*, 1882-3.

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1859 ANDREWS, JAMES, M.D., Everleigh, Green hill, Hampstead, N.W. *Council*, 1881.

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1871 ARGLES, FRANK, L.R.C.P. Ed., Hermon Lodge, Wanstead, Essex, N.E. *Council*, 1886-7.

1888 ARMSTRONG, JAMES, M.B. Edin., 84, Rodney street, Liverpool.

1861 ARMSTRONG, JOHN, M.D., Green street green, Dartford, Kent.

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O.F. AVELING, JAMES H., M.D., Senior Physician to the Chelsea Hospital for Women; 1, Upper Wimpole Street, W. *Council*, 1865-66, 1872, 1884. *Hon. Sec.* 1873. *Hon. Lib.* 1874-6. *Vice-Pres.* 1877-8. *Board Exam. Midwives*, 1872, 1875-83 (*Chairman*, 1878-83). *Trans.* 9.

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1880 BALLS-HEADLEY, WALTER, M.D., 204, Collins street east, Melbourne, Victoria.

1869 BANTOCK, GEORGE GRANVILLE, M.D., Surgeon to the Samaritan Free Hospital; 12, Granville place, Portman square, W. *Council*, 1874-6. *Trans.* 2.

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1877 BURD, EDWARD, M.D., M.C., Senior Physician to the Salop Infirmary; Newport House, Shrewsbury. *Council*, 1886-7. *Hon. Loc. Sec.*

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1886 BYERS, JOHN W., M.D., Physician for Diseases of Women to the Royal Hospital, Belfast; Lower crescent, Belfast.

1883 CALDWELL, WILLIAM T. D., M.D., 284, Kennington park road, S.E.

1887 CAMERON, JAMES CHALMERS, M.D., 43, Belmont park, Montreal.

1887 CAMERON, MURDOCH, M.D. Glas., 7, Newton terrace, Charing Cross, Glasgow.

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1886 CARPENTER, ARTHUR BRISTOWE, M.A., M.B. Oxon., Wykeham House, Bedford Park, Croydon.

1872 CARTER, CHARLES HENRY, M.D., Physician to the Hospital for Women, Soho square; 45, Great Cumberland place, Hyde Park, W. *Council*, 1880-2. *Trans.* 4.

1877 CARVER, EUSTACE JOHN, Fairlawn, 635, Fulham road, S.W.

1887 CASE, WILLIAM, 34, Westbourne road, Arundel square, N.

1869 CASKIE, JOHN BOYD, M.D., 19, Tyndale place, Islington, N.

1878 CASKIE, WILLIAM ALEX., M.A., M.B., Manse Court, 17, Main street, Largs, Ayrshire, N. B.

1863 CAYZER, THOMAS, Mayfield, Aigburth, Liverpool.

1875 CHAFFERS, EDWARD, F.R.C.S., 54, North street, Keighley, Yorkshire.

Elected

1876* CHAMPNEYS, FRANCIS HENRY, M.A., M.D. Oxon., F.R.C.P., Obstetric Physician to, and Lecturer on Midwifery at, St. George's Hospital, 60, Great Cumberland place, W. *Council*, 1880-1. *Hon. Lib.* 1882-3. *Hon. Sec.* 1884-7. *Vice-Pres.* 1888-9. *Board Exam. Midwives*, 1883, 1888-9. *Trans.* 15.

1859 CHANCE, EDWARD JOHN, F.R.C.S., Surgeon to the Metropolitan Free Hospital and City Orthopædic Hospital; 14, Russell square, W.C.

1886 CHAPMAN, CHARLES WILLIAM, L.R.C.P. Lond., The Firs, Cheam, Surrey.

1867* CHARLES, T. EDMONDSTOUNE, M.D., Cannes, France. *Council*, 1882-4.

1874 CHARLESWORTH, JAMES, 25, Birch terrace, Hanley, Staffordshire.

1886 CHARPENTIER, AMBROSE E. L., M.B. Dur., 129, High street, Uxbridge.

1868 CHILD, EDWIN, "Vernham," New Malden, Kingston-on-Thames, Surrey.

1883 CHILDS, CHRISTOPHER, M.A., M.B. Oxon., 2, Royal terrace, Weymouth. *Hon. Loc. Sec.*

1863* CHISHOLM, EDWIN, M.D., Abergeldie, Ashfield, near Sydney, New South Wales. [Per Messrs. Turner and Henderson, care of Messrs. W. Dawson, 121, Cannon street, E.C.].

1885 CHITTENDEN, THOMAS HILLIER, L.R.C.P. Lond., Whitwell, Welwyn.

1883 CLAPHAM, EDWARD, M.D., 29, Lingfield road, Wimbledon.

1859 CLAREMONT, CLAUDE CLARKE, Millbrook House, 1, Hampstead road, N.W.

1879 CLARKE, REGINALD, South Lodge, Lee park, Lee, S.E.

O.F. CLAY, CHARLES, M.D., 39, Queen street, Blackpool.

1876 CLAY, GEORGE LANGSFORD, West View, 443, Moseley road, Highgate, Birmingham.

O.F. CLAY, JOHN, Professor of Midwifery, Queen's College, Birmingham; Allan House, Steelhouse lane, Birmingham. *Council*, 1868-69. *Vice-Pres.* 1872-4.

Elected

1889 CLEMOW, ARTHUR HENRY WEISS, M.D., C.M. Edin., 2, Talgarth road, West Kensington, W.

O.F. CLEVELAND, WILLIAM FREDERICK, M.D., Stuart villa, 199, Maida vale, W. *Council*, 1863-64. *Vice-Pres.* 1875-77, 1887-89. *Trans.* 1.

1881 CLOSE, JAMES ALEX, M.B., Summerfield, St. Clair Co., Illinois, U.S.

1865* COATES, CHARLES, M.D., Physician to the Bath General and Royal United Hospitals; 10, Circus, Bath.

1882 COATES, FREDERICK WILLIAM, M.D., St. John street, Salisbury. *Hon. Loc. Sec.*

1878 COCKELL, FREDERICK EDGAR, Jun., 62, Forest road, Dalston, E.

1875 COFFIN, RICHARD JAS. MAITLAND, F.R.C.P. Ed., Alwington house, Baron's court, West Kensington, W.

1878 COFFIN, THOMAS WALKER, 22, Upper Park road, Haverstock hill, N.W.

1875* COLE, RICHARD BEVERLY, M.D. Jefferson Coll. Philad., 218, Post street, San Francisco, California, U.S.

1888 COLLINS, EDWARD TENISON, Campden House, Oakfield road, Selly park, Birmingham.

1884 COLLINS, WILLIAM JOB, M.D., B.S., B.Sc. Lond., F.R.C.S. Eng., 1, Albert terrace, Gloucester gate, N.W.

1877 COLMAN, WALTER TAWELL, Hon. Surgeon to the Brighton Hospital for Women; 87, Buckingham road, Brighton,

1885 COOK, PHILIP INKERMAN, M.D., Stratton, Tyson road, Forest hill, S.E.

1866 COOMBS, JAMES, M.D., Bedford.

1873 COOPER, FRANK W., Gainsborough house, Leytonstone, E.

1874 COOPER, HERBERT, L.R.C.P. Ed., Rosslyn hill, Hampstead, N.W.

1888 COOPER, PETER, L.R.C.P. Lond., Stainton Lodge, Blackheath, S.E.

1888 CORBY, HENRY, B.A., M.D., 62, South Mall, Cork.

Elected

1875* CORDES, AUG., M.D., Privat Docent at the University of Geneva; 12, Rue Bellot, Geneva. *Trans.* 1.

1883 CORNER, CURSHAM, 113, Mile End road, E.

1888 CORNISH, CHARLES NEWTON, L.R.C.P. Ed., Bushey Heath, Herts.

1860 CORRY, THOMAS CHARLES STEUART, M.D., Senior Surgeon to the Belfast General Dispensary; Ormeau terrace, Belfast. *Council*, 1867. *Hon. Loc. Sec.*

1888 CORY, ISAAC RISING, L.R.C.P. Lond., Shere, Guildford.

1875 CORY, ROBERT, M.D., Assistant Obstetric Physician to St. Thomas's Hospital; 73, Lambeth Palace road, S.E. *Council*, 1879-81, 1884-5. *Vice-Pres.* 1887-88. *Trans.* 1.

1886 COX, JOSHUA JOHN, M.D. Ed., 54, Gildabrook road, Eccles, Manchester.

1869 COX, RICHARD, M.D. St. And., Theale, near Reading. *Trans.* 1.

1877 CRAWFORD, JAMES, M.D. Durh., 21, Victoria square, S.W.

1882 CREASE, JAMES ROBERTSON, F.R.C.S. Ed., 2, Ogle terrace, South Shields.

1881 CREASY, JAMES GIDEON, Rectory lodge, Brasted, Sevenoaks.

1883 CREMEN, PATRICK JOHN, M.D., 4, Camden place, Cork.

1876 CREW, JOHN, Higham Ferrers, Northamptonshire.

1881 CRONK, HERBERT GEORGE, M.B. Cantab., Repton, near Burton-on-Trent.

1886* CROSS, WILLIAM JOSEPH, M.B., Horsham, Victoria, Australia.

1889 CROUCH, EDWARD THOMAS, Lee House, Stoke road, Gosport.

1875* CULLINGWORTH, CHARLES JAMES, M.D., F.R.C.P., Obstetric Physician to, and Lecturer on Obstetric Medicine at, St. Thomas's Hospital; 46, Brook street, Grosvenor square, W. *Council*, 1883-5. *Vice-Pres.* 1886-8. *Board Exam. Midwives*, 1889. *Trans.* 5.

1862 CUMBERBATCH, LAWRENCE TRENT, M.D., 25, Cadogan place, Belgrave square, S.W. *Council*, 1868-70. *Vice-Pres.* 1878.

Elected

1859 CURGENVEN, J. BRENDON, 11, Craven hill gardens, Bayswater, W. *Council*, 1870-72. *Trans.* 3.

1885 DAKIN, W. RADFORD, M.D., Obstetric Physician to Out-Patients, Great Northern Central Hospital; 57, Welbeck street, Cavendish square, W. *Council*, 1889. *Trans.* 1.

1868 DALY, FREDERICK HENRY, M.D., 185, Amhurst road, Hackney Downs, N.E. *Council*, 1877-9. *Vice-Pres* 1883-5. *Trans.* 2.

1882 DAMBRILL-DAVIES, WILLIAM R., Alderley Edge, Cheshire.

1888 DANE, ROBERT, 86, Finchley road, N.W.

1884 DARWIN, GEORGE HENRY, M.R.C.P., The Cedars, Albert park, Didsbury, near Manchester.

1876 DAVIES, GOMER, L.R.C.P. Ed., 9, Pembridge villas, Bayswater, W.

1884 DAVIES, JOHN, 91, New North road, N.

1885 DAVIES, WILLIAM MORRISTON, M.D., 55, Gordon square, W.C.

1877 DAVSON, SMITH HOUSTON, M.D., Campden villa, 203, Maida vale, W. *Council*, 1889.

1889 DAWSON, WILLIAM EDWARD, L.K.Q.C.P. & L.M., 29, Chiswell street, E.C.

1878 DAY, EDMUND OVERMAN, Assistant Surgeon to the Royal Infirmary for Children and Women, Waterloo Bridge road; 78, Waterloo road, S.E.

1880 DAY, WILLIAM HANKES, Surgeon to the City Prisons, Norwich; 3, Surrey Street, Norwich. *Trans.* 1.

1859 DAY, WILLIAM HENRY, M.D., Physician to the Samaritan Free Hospital for Women and Children; 10, Manchester square, W. *Council*, 1873-75. *Vice-Pres.* 1885-6

1877 DEWAR, JOHN, L.R.C.P. Ed., 132, Sloane street, S.W.

1885 D'MONTE, DOMINICK A., M.D., Bandora, Bombay.

1887 DODSON, ARTHUR EDWARD, L.R.C.P. and L.M. Ed., Windermere villas, Earlsfield, Tooting, S.W.

1879 DOLAN, THOMAS MICHAEL, M.D., Horton house, Halifax.

Elected

1886 DONALD, ARCHIBALD, M.A., M.D. Edin., 274, Oxford road, Manchester.

1879 DORAN, ALBAN H. G., F.R.C.S., Surgeon to Out-Patients, Samaritan Free Hospital; 9, Granville place, Portman square, W. *Council*, 1883-5. *Hon. Lib.* 1886-7. *Hon. Sec.* 1888-89. *Trans.* 7.

1887 DOVASTON, MILWARD EDMUND, 81, Queen's crescent, Haverstock hill, N.W.

1880 DOWNES, DENIS SIDNEY, L.K.Q.C.P. I., 55, Kentish town road, N.W.

1884 DOYLE, E. A. GAYNES, L.R.C.P., Colonial Hospital, Port of Spain, Trinidad.

O.F. DRAGE, CHARLES, M.D., Hatfield, Herts. *Council*, 1861-4. *Trans.* 1.

1885 DRAGE, LOVELL, M.A., M.B., B.S. (Oxon), The Small House, Hatfield.

1871 DRAKE-BROCKMAN, EDWARD FORSTER, F.R.C S., L.R.C.P. Lond., Surgeon-Major; Superintendent Eye Infirmary, Madras; Professor of Physiology and Ophthalmology, Madras Medical College. [*Per* Messrs. Richardson and Co., East India Army Agency, 25, Suffolk street, Pall Mall, S.W.]

1884 DRAKE, CHARLES HENRY, 204, Brixton hill, S.W.

1878 DRING, WILLIAM ERNEST, L.R.C.P. Ed., Buckhurst hill, Essex.

1884 DUKE, JOHN C., The Glen, Lewisham, S.E.

1886 DUKES, WILLIAM PROFIT, L.R.C.P. Ed., 75, Brick lane, Spitalfields, E.

1883 DUNCAN, ALEXANDER GEORGE, M.B., 25, Amhurst park, Stamford hill, N.E.

O.F. DUNCAN, JAMES, M.B., 8, Henrietta street, Covent garden, W.C. *Council*, 1873-74.

1888 DUNCAN, WILLIAM, L.R.C.P. & S.Ed., 17, Redland grove, Bristol.

1882 DUNCAN, WILLIAM, M.D., Assistant Obstetric Physician to the Middlesex Hospital; 6, Harley street, W. *Council*, 1885-6, 1888-89. *Trans.* 1.

Elected

1871 EASTES, GEORGE, M.B., F.R.C.S., 69, Connaught street, Hyde-park square, W. *Council*, 1878-80.

1883 ECCLES, F. RICHARD, M.D., Examiner for the College of Physicians and Surgeons, Ontario; Professor of Physiology, Western University; 1, Ellwood place, Queen's avenue, London, Ontario, Canada.

1879 ELDER, GEORGE, M.D., C.M., Surgeon to the Samaritan Hospital for Women, Nottingham; 17, Regent street, Nottingham.

1879 ELKINGTON, ARTHUR GUY, Deputy Surgeon-General, late Grenadier Guards, 52, Gillingham street, Eccleston square, S.W. *Council*, 1886-7.

1878 ELLERY, RICHARD, L.R.C.P. Ed., Plympton, Devon.

1873 ENGELMANN, GEORGE JULIUS, A.M., M.D., 3003, Locust street, St. Louis, Missouri, U.S.

1884 ENGLISH, THOMAS JOHNSTON, M.D., 128, Fulham road, S.W.

1875 EWART, JOHN HENRY, Eastney, Devonshire place, Eastbourne.

1876 FARNCOMBE, RICHARD, 40, Belgrave street, Balsall heath, Birmingham.

1869 FARQUHAR, WILLIAM, M.D., Deputy Surgeon-General, Coonoor, Neilgherries, Madras.

1861 FARR, GEO. F., L.R.C.P. Ed., Slade House, 175, Kennington road, S.E. *Council*, 1885.

1882 FARRAR, JOSEPH, M.D., Gainsborough.

1868 FEGAN, RICHARD, M.D., Westcombe park, Blackheath, S.E.

1888 FEGEN, CHARLES MILTON, Devonshire House, Brandon, Suffolk.

1886 FENNELL, DAVID, L.K.Q.C.P.I., 517, Commercial road East, E.

1886 FENTON, HERBERT ALFRED HILL, M.D. Brussels, 1, Cumberland street, S.W.

1883 FENTON, HUGH, M.D., 29, Brook street, Grosvenor square, W.

Elected

1886 FISHER, FREDERICK BAZLEY, L.R.C.P. Lond., West Walk, Dorchester.

1870 FISHER, JOHN MOORE, M.D., 6, Pryme street, Hull.

1882 FITZGERALD, CHARLES EGERTON, M.D., West Terrace, Folkestone. *Hon. Loc. Sec.*

1877* FONMARTIN, HENRY DE, M.D., The Elms, Parkhurst, Isle of Wight.

1884 FORD, ALEXANDER, L.R.C.P.Ed., 9, Parnell street, Waterford.

1877* FORD, JAMES, M.D., Eltham, Kent.

1884 FORSYTH, ALEXANDER, M.D., 12, Park place, Greenwich, S.E.

1884 FOURACRE, ROBERT PERRIMAN, 20, Tollington park, N.

1886 FOWLER, CHARLES OWEN, M.D., Parchmore road, Thornton Heath, S.W.

1875* FRASER, ANGUS, M.D., Physician and Lecturer on Clinical Medicine to the Aberdeen Royal Infirmary; 232, Union street, Aberdeen.

1888 FRASER, JAMES ALEXANDER, L.R.C.P. Lond., Western Lodge, Romford.

1886 FREELAND, ERNEST HARDING, L.R.C.P. Lond.

1867 FREEMAN, HENRY W., 24, Circus, Bath.

1880 FRY, JOHN BLOUNT, Ashley Lodge, Esher, Surrey.

1883 FULLER, HENRY ROXBURGH, M.D. Cantab., 45, Curzon street, Mayfair, W. *Trans.* 1.

1886 FURNER, WILLOUGHBY, F.R.C.S., 2, Brunswick place, Brighton. *Hon. Loc. Sec.*

1874* GALABIN, ALFRED LEWIS, M.A., M.D., Obstetric Physician to, and Lecturer on Midwifery at, Guy's Hospital; 49, Wimpole street, Cavendish square, W. *Council*, 1876-78. *Hon. Lib.* 1879. *Hon. Sec.* 1880-3. *Vice-Pres.* 1884. *Treas.* 1885-8. *Pres.* 1889. *Trans.* 11.

1888 GALLOWAY, ARTHUR WILTON, L.R.C.P. Lond., 79, New North Road, N.

Elected

1863 GALTON, JOHN H., M.D., Woodside, 39, Anerley road, Upper Norwood, S.E. *Council*, 1874-6.

1881 GANDY, WILLIAM, Hill Top, Central hill, Norwood, S.E.

1886 GARDE, HENRY CROKER, F.R.C.S. Edin., Maryborough, Queensland.

1887 GARDINER, BRUCE H. J., L.R.C.P. Ed., Gloucester House, Barry road, East Dulwich, S.E.

1879 GARDNER, JOHN TWINAME, 6, Hillsboro' terrace, Ilfracombe.

1872 GARDNER, WILLIAM, M.A., M.D., Professor of Gynæcology, McGill University; Gynæcologist to the Montreal General Hospital; 109, Union avenue, Montreal, Canada.

1876 GARNER, JOHN, 52, New Hall street, Birmingham.

1873 GARTON, WILLIAM, M.D., F.R.C.S., Hardshaw street, St. Helen's, Lancashire.

1889 GELL, HENRY WILLINGHAM, M.A., M.B. Oxon., 43, Albion street, Hyde park, W.

1859 GERVIS, HENRY, M.D., F.R.C.P., Consulting Obstetric Physician to St. Thomas's Hospital; 40, Harley street, Cavendish square. *Council*, 1864-66, 1889. *Hon. Sec.* 1867-70. *Vice-Pres.* 1871-3. *Treas.* 1878-81. *Pres.* 1883-4. *Trans.* 8.

1866 GERVIS, FREDERICK HEUDEBOURCK, 1, Fellows road Haverstock hill, N.W. *Council*, 1877-9. *Trans.* 1.

1884 GIBB, CHARLES JOHN, M.D., Westgate House, Newcastle-on-Tyne.

1875 GIBBINGS, ALFRED THOMAS, M.D., 93, Richmond road, Dalston, N.E. *Council*, 1885-6, 1888.

1883 GIBBONS, ROBERT ALEXANDER, M.D., Physician to the Grosvenor Hospital for Women and Children; 32, Cadogan place, S.W. *Council*, 1889. *Trans.* 1.

1874 GIBSON, JAMES EDWARD, Hillside, West Cowes, Isle of Wight.

1877 GIFFARD, DOUGLAS WILLIAM, 5, Pavilion Parade, Old Steyne, Brighton.

1869 GILL, WILLIAM, L.R.C.P. Lond., 11, Russell square, W.C.

Elected

1871 GODDARD, EUGENE, M.D. Durh., North Lynne, Highbury New Park, N. *Trans.* 1.

1876 GODFRAY, ALFRED CHARLES, M.B., St. Helier House, Jersey.

1871 GODSON, CLEMENT, M.D., C.M., Assistant Physician-Accoucheur to St. Bartholomew's Hospital; 9, Grosvenor street, W. *Council*, 1876-77. *Hon. Sec.* 1878-81. *Vice-Pres.* 1882-4. *Board Exam. Midwives*, 1877, 1882-86. *Trans.* 5.

1868 GODWIN, ASHTON, M.D., 28, Brompton crescent, Brompton, S.W.

1873 GOLDSMITH, JOHN, M.D., Highworth, Worthing.

1873 GOODCHILD, NATHANIEL, L.R.C.P. Ed., Sidney House, Highgate road, N.W.

1883 GORDON, JOHN, M.D., 10, Amersham road, New Cross, S.E.

1869 GOSS, TREGENNA BIDDULPH, 1, The Circus, Bath. *Hon. Loc. Sec.*

1884 GOWANS, WILLIAM, F.R.C.S. Ed., 1, Victoria terrace, South Shields.

1889 GRAHAM, ARTHUR, L.R.C.P. & S. Ed., 4, Westbourne place, S.W.

1885 GRANT, OGILVIE, M.D., Queen Mary's House, Inverness.

1875 GRAY, JAMES, M.D., 15, Newton terrace, Glasgow.

1884 GREENE, WALTER, L.R.C.P. Lond., Wallingford.

1887 GREENWOOD, EDWIN CLIMSON, L.R.C.P., 19, St. John's wood park, N.W.

1863 GRIFFITH, G. DE GORREQUER, 34, St. George's square, S.W. *Trans.* 2.

1869 GRIFFITH, JOHN T., M.D., Talfourd House, Camberwell, S.E. *Council*, 1884-6.

1879* GRIFFITH, WALTER SPENCER ANDERSON, M.B. Cantab., F.R.C.S., M.R.C.P., Obstetric Physician to the Great Northern Central Hospital; Tutor in Obstetrics and Gynæcology at St. Bartholomew's Hospital; 114, Harley street, W. *Council*, 1886-8. *Board Exam. Midwives*, 1887-89. *Trans.* 3.

Elected

1870 GRIGG, WILLIAM CHAPMAN, M.D., Physician to the In-patients, Queen Charlotte's Lying-in Hospital; Assistant Obstetric Physician to the Westminster Hospital; 27, Curzon street, Mayfair. *Council*, 1875-77. *Board Exam. Midwives*, 1878-79.

1888* GRIMSDALE, THOMAS BABINGTON, B.A., M.B. Cantab., 50 Rodney street, Liverpool.

O.F. GRIMSDALE, THOS. F., L.R.C.P. Ed., Consulting Surgeon to the Lying-in Hospital; 29, Rodney street, Liverpool. *Council*, 1861-62. *Vice-Pres.* 1875-76.

1882 GRIPPER, WALTER, M.B. Cantab., The Poplars, Wallington, Surrey.

1880 GROGONO, WALTER ATKINS, Berwick House, Broadway, Stratford, E.

1879 GROVE, WILLIAM RICHARD, M.D., St. Ives, Huntingdonshire.

1887 GROWSE, WILLIAM, L.R.C.P. Lond., Marton, near Rugby.

1885 GRÜN, EDWARD FERDINAND, 2, Lower Richmond road, Putney, S.W.

1887 HACKNEY, JOHN, M.D. St. And., Hythe.

1867 HADAWAY, JAMES, L.R.C.P. Ed., Dent-de-Lion Villa, Garlinge, near Margate.

1876 HADDEN, JOHN, M.D., 31, West street, Horncastle, Lincolnshire.

1881 HAIR, JAMES, M.D., Brinklow, Coventry.

1889 HALE, CHARLES D. B., L.R.C.P. Lond., 8, Sussex gardens, Hyde park, W.

1859 HALL, FREDERICK, 1, Jermyn street, St. James's, S.W.

1871 HALLOWES, FREDERICK B., Redhill, Reigate, Surrey. *Council*, 1885-6, 1888-9.

1880 HAMES, GEORGE HENRY, F.R.C.S., 2, Queensborough terrace, W.

1887 HAMILTON, JOHN, F.R.C.S. Ed., Swadlincote, Burton-on-Trent.

1880 HAMILTON, THOMAS, M.D., Melrose House, 129, Green lanes, Stoke Newington, N.

Elected

1883 HANDFIELD-JONES, MONTAGU, M.D.Lond., M.R.C.P., Joint-Lecturer on Midwifery at, and Physician Accoucheur in charge of Out-patients to, St. Mary's Hospital; 24, Montagu square, W. *Council*, 1887-89.

1860 HARDEY, KEY, Surgeon to the West City Dispensary; 4, Wardrobe place, Doctors' Commons, E.C.

1886 HARDY, HENRY L. P., Holly Lodge, Richmond road, Kingston-on-Thames.

1877 HARPER, GERALD S., M.B. Aber., 5, Hertford street, May Fair, W.

1878 HARRIES, THOMAS DAVIES, F.R.C.S., Grosvenor House, Aberystwith, Cardiganshire.

1867 HARRIS, WILLIAM H., M.D., 78, Oxford gardens, W.

1861 HARRIS, WILLIAM JOHN, Church House, Heene, Worthing. *Hon. Loc. Sec.*

1880 HARRISON, RICHARD CHARLTON, 13, Sandringham gardens, Ealing, W.

1887 HASTINGS, CHARLES J. C. O., M.D., 189, Parliament street, Toronto.

1886 HARTLEY, HORACE, L.R.C.P. and S. Ed., Stone, Staffordshire.

1886 HARTLEY, REGINALD, L.R.C.P. and S. Ed., Kirkgate House, Thirsk.

1880 HARVEY, JOHN STEPHENSON, 69, Rue Faidherbe, Boulogne-sur-Mer, France.

1865 HARVEY, ROBERT, M.D., 52, Chowringhee, Calcutta. [Per Messrs. Cochran and Macpherson, 152, Union street, Aberdeen.] *Trans.* 1. *Hon. Loc. Sec.*

1886 HARVEY, SIDNEY FRED., L.R.C.P. Lond., 42, Perham road, West Kensington, W.

1888 HAYCOCK, HENRY EDWARD, L.R.C.P. Ed., Whitwell, Welwyn.

1865 HAYES, HAWKESLEY ROCHE, Basingstoke, Hants.

1873 HAYES, THOMAS CRAWFORD, M.D., Assistant Obstetric Physician to King's College Hospital; 17, Clarges street, Piccadilly, W. *Council*, 1876-78.

Elected

1880 HEATH, WILLIAM LENTON, M.B., 88A, Cromwell road, Queen's gate, S.W. *Trans.* 1.

1867 HEMBROUGH, JOHN WILLIAM, Ivy Cottage, Waltham, Grimsby.

1881 HEPBURN, WILLIAM ALEX., Rosslyn House, Coxhoe, Co. Durham.

1876 HERMAN, GEORGE ERNEST, M.B., F.R.C.P., Obstetric Physician to, and Lecturer on Midwifery at, the London Hospital; 20, Harley street, Cavendish square, W. *Council*, 1878-79. *Hon. Lib.* 1880-1. *Hon. Sec.* 1882-5. *Vice-Pres.* 1886-7. *Board Exam. Midwives*, 1886-88. *Treas.* 1889. *Trans.* 17.

1887 HEWITT, FREDERIC WILLIAM, M.D. Cantab., 10, George street, Hanover square, W.

O.F. HEWITT, GRAILY, M.D., F.R.C.P., Consulting Obstetric Physician to University College Hospital; 36, Berkeley square, W. *Hon. Sec.* 1859-64. *Treas.* 1865-66. *Vice-Pres.* 1867-68. *Pres.* 1869-70. *Trans.* 21.

1860 HICKS, JOHN BRAXTON, M.D., F.R.C.P., F.R.S., Physician Accoucheur to, and Lecturer on Midwifery and Diseases of Women at, St. Mary's Hospital; 24, George street, Hanover square. *Council*, 1861-2, 1869. *Hon. Sec.* 1863-65. *Vice-Pres.* 1866-68. *Treas.* 1870. *Pres.* 1871-2. *Trans.* 36.

1860 HIGGS, THOMAS FREDERIC, M.D., Beaconsfield House, Dudley, Worcestershire.

1886 HOAR, CHARLES, M.B., C.M. Aber., Bantony House, Hurst Green, Hawkhurst (Railway Station Robertsbridge).

1886 HODGES, HERBERT CHAMNEY, L.R.C.P. Lond., Watton, Herts.

O.F. HODGES, RICHARD, M.D., F.R.C.S., 36, Harewood Square, N.W. *Trans.* 3.

1887 HODSON, HENRY ALGERNON, L.R.C.P. Ed. & L.M., 23, Brunswick square, Brighton.

1886 HOLBERTON, HENRY NELSON, L.R.C.P. Lond., East Molesey.

Elected

1875 HOLLINGS, EDWIN, M.D., 4, Gordon street, Gordon square, W.C. *Council*, 1888-9.

1886 HOLLOWAY, WILLIAM GEORGE, B.A., M.B. Cantab., East Sussex Hospital, Hastings.

1859 HOLMAN, CONSTANTINE, M.D., The Barons, Reigate, Surrey. *Council*, 1867-69. *Vice-Pres.* 1870-71.

1880 HONIBALL, OSCAR DUNSCOMBE, M.D., George Town, Demerara, British Guiana.

1864 HOOD, WHARTON PETER, M.D., 11, Seymour street, Portman square, W.

1872 HOPE, WILLIAM, M.D., Physician to Queen Charlotte's Lying-in Hospital; 56, Curzon street, Mayfair, W. *Council*, 1877-9. *Board Exam. Midwives*, 1873-4.

1884 HOPKINS, JOHN, L.R.C.P. Ed., 93, Camberwell road, S.E.

1883* HORROCKS, PETER, M.D., M.R.C.P. Lond., Assistant Obstetric Physician to, and Demonstrator of Practical Obstetrics at, Guy's Hospital; 9, St. Thomas's street, S.E. *Council*, 1886-7. *Hon. Lib.* 1888-9. *Trans.* 1.

1876 HORSMAN, GODFREY CHARLES, 22, King street, Portman square, W.

1883 HOSKIN, THEOPHILUS, L.R.C.P. Lond., 186, Amhurst road, N.E.

1883 HOUCHIN, EDMUND KING, L.R.C.P. Ed., 23, High street, Stepney, E.

1884 HOUGH, CHARLES HENRY, Full street, Derby.

1877 HOWELL, HORACE SYDNEY, M.D., East Grove House, 18, Boundary road, St. John's Wood, N.W.

1879 HUBBARD, THOMAS WELLS, Lenham, Bromley, Kent.

1885 HUGHES, EDGAR A., L.R.C.P. Lond., 91, Onslow gardens, S.W.

1884* HURRY, JAMIESON BOYD, M.D. Cantab., 43, Castle street, Reading. *Council*, 1887-9. *Trans.* 1.

1878 HUSBAND, WALTER EDWARD, 56, Bury New Road, Manchester.

1889 HUMPHRYS, CHARLES BEYER, L.R.C.P. & S. Edin., Lingdale, Lansdown road, Bournemouth.

Elected

1882 HUTTON, ROBERT JAMES, L.R.C.P. Ed., Stapleton House, Stapleton Hall road, Finsbury Park, N.

1883 INMAN, ROBERT EDWARD, 243, Hackney road, E.

1884 IRWIN, JOHN ARTHUR, M.A., M.D., 427, Fifth avenue, New York.

1887 JACKSON, G. E. CORRIE, F.R.C.S. Ed., 17, Poland street, W.

1883 JACKSON, GEORGE HENRY, Lansdowne House, Tottenham.

1884 JACKSON, JAMES, 15, Huntingdon street, Barnsbury, N.

1864 JACKSON, ROBERT, M.D., 53, Notting hill square, W. *Council*, 1885.

1886 JACOMB-HOOD, CHARLES JOHN, L.R.C.P., King's College Hospital, W.C.

1873 JAKINS, WILLIAM VOSPER, L.R.C.P. Ed., 165, Collins street East, Melbourne.

1872 JALLAND, ROBERT, Horncastle, Lincolnshire. *Trans.* 1.

1877 JAMIESON, PATRICK, M.A., 3, St. Peter's street, Peterhead, Aberdeenshire.

1885 JAMIESON, ROBERT ALEXANDER, M.D., Shanghai. [Per Messrs. Henry S. King and Co., 65, Cornhill, E.C.]

1886 JAMISON, ARTHUR ANDREW, M.D. Glas., 26, Lowndes street, S.W.

1883* JENKINS, EDWARD JOHNSTONE, M.B. Oxon., Australian Club, Sydney. [Per H. K. Lewis, 136, Gower street, W. C.]

1877 JENKS, EDWARD W., M.D., 84, Lafayette avenue, Detroit, Michigan, U.S.

1882 JENNINGS, CHARLES EGERTON, F.R.C.S. Eng., Assistant Surgeon to the North-West London Hospital; 15, Upper Brook street, Grosvenor square, W.

1883 JOHNSON, ARTHUR JUKES, M.B., 52, Bloor street west, Toronto, Ontario, Canada.

1888 JOHNSON, JOHN GEORGE, L.R.C.P. Lond., Concrete House, Swindon.

1877 JOHNSON, SAMUEL, M.D., 5, Hill street, Stoke-upon-Trent.

1881 JOHNSTON, JOSEPH, M.D., 24, St. John's Wood Park, N.W.

Elected

1879 JOHNSTON, WM. BEECH, M.D., 157, Jamaica road, Bermondsey, S.E.

1868 JONES, EVAN, Ty-Mawr, Aberdare, Glamorganshire. *Council*, 1886-8. *Hon. Loc. Sec.*

1888 JONES, GUY CARLETON, c/o Hon. G. Jones, Halifax, Nova Scotia.

1878 JONES, H. MACNAUGHTON, M.D., F.R.C.S.I. and Edin., 141, Harley street, Cavendish square, W.

1881 JONES, JAMES ROBERT, M.B., 171, Donald street, Winnipeg, Manitoba, Canada.

1868 JONES, JOHN, 60, King street, Regent street, W.

1887 JONES, J. TALFOURD, M.B. Lond., Rose Bank, South terrace Eastbourne.

1876 JONES, LESLIE, M.D., C.M., Limefield House, Cheetham Hill, Manchester.

1886 JONES, LEWIS, M.D., Oakmead, Balham, S.W.

1885 JONES, P. SYDNEY, M.D., 16, College street, Hyde Park, Sydney. [Per Messrs. D. Jones and Co., 1, Gresham Buildings, Basinghall street, E.C.]

1873 JONES, PHILIP W., Silver street, Enfield.

1886 JONES, WILLIAM OWEN, The Downs, Bowden, Manchester.

1879 JOUBERT, CHARLES HENRY, M.B. Lond., F.R.C.S. Eng., Surgeon-Major, Bengal Medical Dept., 54, Chowringhee, Calcutta.

1878 JUDSON, THOMAS ROBERT, L.R.C.P. Lond., Hayman's Green, West Derby, Liverpool.

1875 JUKES, AUGUSTUS, M.B., N. W. Mounted Police, Regina, N. W. Territory, Canada.

1878 KANE, NATHANIEL H. K., M.D., Lanherne, Kingston hill, Surrey.

1884 KEATES, WILLIAM COOPER, L.R.C.P., 2, Tredegar villas, East Dulwich road, S.E.

1880 KEBBELL, ALFRED, Flaxton, York.

O.F. KEELE, GEORGE THOMAS, 81, St. Paul's road, Highbury, N. *Council*, 1885.

Elected

1883 KEELING, JAMES HURD, M.D., 267, Glossop road, Sheffield. *Hon. Loc. Sec.*

1874 KEMPSTER, WILLIAM HENRY, L.R.C.P. Ed., Oak House, Bridge road, Battersea, S.W.

1886 KENNEDY, ALFRED EDMUND, L.R.C.P. Ed., Chesterton House, Plaistow, E.

1879 KER, HUGH RICHARD, L.R.C.P. Ed., Townsend House, Hales-Owen.

1865* KERNOT, GEORGE CHARLES, 9, Elphinstone road, Hastings.

1872 KERR, NORMAN S., M.D., F.L.S., 42, Grove road, Regent's park, N.W.

1877* KERSWILL, JOHN BEDFORD, M.R.C.P. Ed., Fairfield, St. German's, Cornwall.

1878 KHORY, RUSTONJEE NASERWANJEE, M.D. Brussels, L.Med. Bombay, Physician to the Parell Dispensary, Bombay; Girgaum road, Bombay.

O.F. KIALLMARK, HENRY WALTER, 5, Pembridge gardens, Bayswater. *Council*, 1879-80.

1860 KINGSFORD, EDWARD, F.R.C.S., Surgeon to the Sunbury Dispensary; Sunbury-on-Thames.

1862 KIRKPATRICK, JOHN RUTHERFORD, M.D. Dub., King's Professor of Midwifery, Dublin University; 4, Upper Merrion street, Dublin. *Council*, 1872-4.

1872* KISCH, ALBERT, 3, Sutherland gardens, Maida vale, W.

1867 KNAGGS, HENRY GUARD, M.D., 189, Camden road, N.W.

1876 KNOTT, CHARLES, M.R.C.P. Ed., Liz Ville, Elm grove, Southsea.

1881 LACY, CHARLES SETHWARD DE LACY, M.B., Biarritz.

1867 LANGFORD, CHARLES P., Sunnyside, Hornsey lane, N.

1887 LANGHORNE, THOMAS GRANT, Albany, W. Australia.

1883 LANGLEY, AARON, L.R.C.P. Ed., 149, Walworth road, S.E.

1886 LANKESTER, HERBERT HENRY, M.D. Lond., 1, Elm park gardens, South Kensington, W.

1886 LAUDER, WILLIAM, M.D. Edin., 260, Oxford road, Manchester.

Elected

1887 LAW, WILLIAM THOMAS, M.D. Edin., 9, Norfolk crescent, W.

1875 LAWRENCE, ALFRED EDWARD AUST, M.D., Physician-Accoucheur to the Bristol General Hospital; 15, Richmond hill, Clifton, Bristol. *Council*, 1885-86, 1888. *Vice-Pres.*, 1889. *Hon. Loc. Sec.*

1878 LEACHMAN, ALBERT WARREN, M.D., Fairley, Petersfield, Hants.

1884* LEDIARD, HENRY AMBROSE, M.D., 43, Lowther street, Carlisle. *Trans.* 1.

1887 LEES, EDWIN LEONARD, M.B., C.M. Ed., 2, The Avenue, Redland road, Bristol.

1860 LEISHMAN, WILLIAM, M.D., Physician to the University Lying-in Hospital, Regius Professor of Midwifery in the University of Glasgow; 11, Woodside crescent, Glasgow. *Council*, 1866-68. *Vice-Pres.* 1869-70. *Trans.* 1.

1881 LE PAGE, JOHN FISHER, M.D., 17, The Crescent, Salford, Manchester.

1885 LEWERS, ARTHUR H. N., M.D. Lond., M.R.C.P., Assistant Obstetric Physician to the London Hospital; 60, Wimpole street, W. *Council*, 1887-89. *Trans.* 4.

1877 LEWIS, JOHN RIGGS MILLER, M.D., Deputy-Surgeon General, Markham Lodge, Liverpool road, Kingston hill, Surrey.

1885 LIDIARD, SYDNEY ROBERT, L.R.C.P. Ed., 11, Charlotte street, Hull.

1875 LIEBMAN, CARLO, M.D. Vienna, Principal Surgeon, Trieste Civil Hospital, Trieste, Austria. *Trans.* 1.

1874 LITHGOW, ROBERT ALEXANDER DOUGLAS, M.R.C.P. Ed., 27A, Lowndes street, Belgrave square, S.W.

1868 LLEWELLYN, EVAN, L.R.C.P. Ed., The Limes, Bow road, E.

1872* LOCK, JOHN GRIFFITH, M.A., 2, Rock Terrace, Tenby.

1859 LOMBE, THOMAS ROBERT, M.D., Bemerton, Torquay.

1862 LOWE, GEORGE, F.R.C.S., 5, Horninglow street, Burton-on-Trent, Staffordshire. *Council*, 1887-89. *Trans.* 2. *Hon. Loc. Sec.*

Elected

1873 LUSH, WILLIAM JOHN HENRY, M.D. Brussels, Associate of King's College, London; Fyfield House, Andover.

1878* LYCETT, JOHN ALLAN, M.D., The "Hollies," Graiseley, Wolverhampton.

1888 MACKERN, JOHN, B.A., M.D. Cantab., F.R.C.S., 30, Cambridge street, Hyde Park, W.

1871 MCCALLUM, DUNCAN CAMPBELL, M.D., Professor of Midwifery and Diseases of Women and Children, McGill University; 45, Union avenue, Montreal, Canada. *Trans.* 4.

1884 MCCARTHY, GEORGE FRANCIS, L.K.Q.C.P., 138, Westminster Bridge road, S.E.

1879 MACKEOUGH, GEORGE J., M.D., Chatham, Ontario, Canada.

O.F. MACKINDER, DRAPER, M.D., Consulting Surgeon to the Gainsborough Dispensary; Gainsborough, Lincolnshire. *Council*, 1871-3. *Trans.* 2.

1879 MACLAURIN, HENRY NORMAND, M.D., 155, Macquarie street, Sydney, New South Wales.

1886 MCMULLEN, WILLIAM, L.K.Q.C.P.I., 319A, Brixton road, S.W.

1859 MADGE, HENRY M., M.D., 4, Upper Wimpole street, W. *Council*, 1863-65, 1884. *Vice-Pres.* 1872-4. *Trans.* 15.

1884 MALCOLM, JOHN D., M.B., C.M., 24, Bryanston street, W.

1871 MALINS, EDWARD, M.D., Obstetric Physician to the General Hospital, Birmingham; 8, Old square, Birmingham. *Council*, 1881-3. *Vice-Pres.* 1884-6. *Hon. Loc. Sec.*

1876 MANBY, FREDERICK EDWARD, 10, King street, Wolverhampton.

1868 MARCH, HENRY COLLEY, M.D., 2, West street, Rochdale.

1887 MARK, LEONARD P., L.R.C.P. Lond., 18, Earl's Court gardens, W.

1860 MARLEY, HENRY FREDERICK, The Nook, Padstow, Cornwall.

Elected

1862 MARRIOTT, ROBERT BUCHANAN, Swaffham, Norfolk.

1887 MARSH, O. E. BULWER, L.R.C.P. Ed., Ventnor House Newport, Monmouthshire.

1873 MARTIN, HENRY CHARRINGTON, M.B., C.M., 11, Somers place, Hyde park, W.

1887 MASON, ARTHUR HENRY, L.R.C.P. Lond., High street, Walton-on-Thames.

1877 MASON, SAMUEL BUTLER, L.R.C.P. Ed., Denham House, Pontypool, Monmouthshire.

1884 MASSEY, HUGH HOLLAND, 2, North terrace, Camberwell, S.E.

1884 MASTERS, JOHN ALFRED, L.R.C.P. Lond., Westall House, Brook green, W.

1887 MAUGHAN, JAMES, L.R.C.P. Lond., 56, Albany street, Regent's park, N.W.

1877 MAUNSELL, H. WIDENHAM, A.M., M.D., Pitt and London street, Dunedin, New Zealand.

1883 MAURICE, OLIVER CALLEY, 75, London street, Reading. *Council*, 1888-9.

1877 MAY, LEWIS JAMES, Bountis Thorne, Seven Sisters road, Finsbury Park, N.

1884 MAYNARD, EDWARD CHARLES, L.R.C.P. Ed., 11, Shellons street, Folkestone.

1885 MELLER, CHARLES BOOTH, L.R.C.P. Ed., Cowbridge, Glamorganshire.

1886 MENNELL, ZEBULON, 31, Shepherd's Bush road, W.

1882 MEREDITH, WILLIAM APPLETON, M.B., C.M., Surgeon to the Samaritan Free Hospital for Women and Children; 6, Queen Anne street, Cavendish square, W. *Council*. 1886-8. *Trans*. 2.

1883 MIDDLEMIST, ROBERT PERCY, L.R.C.P. Lond., 6, Devonport street, Hyde park, W.

1875* MILES, ABIJAH J., M.D., Professor of Diseases of Women and Children in the Cincinnati College of Medicine, Cincinnati, Ohio, U.S.

1876 MILLMAN, THOMAS, M.D., Asylum for the Insane, Kingston, Ontario, Canada.

Elected

1880 MILLS, ROBERT JAMES, M.B., M.C., All Saints' Green, Norwich.

1886 MILNER, SAMUEL GEORGE, L.R.C.P. Ed., Hillside, Dulwich road, Norwood, S.E.

1876 MILSON, RICHARD HENRY, M.D., 88, Finchley road, South Hampstead, N.W.

1869 MINNS, PEMBROKE R. J. B., M.D., Thetford, Norfolk.

1867 MITCHELL, ROBERT NATHAL, M.D., Chester House, Wickham road, Brockley, S.E.

1868 MOOTHOOSAWMY, P. S., M.D., F.L.S., Tanjore, Madras Presidency. *Trans.* 1.

1877 MOON, FREDERICK, M.B., Bexley house, Greenwich.

1873 MOON, ROBERT HENRY, F.R.C.S., Fern Lodge, West Norwood, S.E.

1859 MOORHEAD, JOHN, M.D., Surgeon to the Weymouth Infirmary and Dispensary; Weymouth, Dorset.

1888 MORGAN, GEORGE JOHN, L.K.Q.C.P. & L.M., Dovaston House, Kinnerley, West Felton.

1888 MORISON, ALEXANDER, M.D. Ed., Dunnottar, 115, Green lanes, Stoke Newington, N.

1883 MORRIS, CLARKE KELLY, Gordon Lodge, Charlton road, Blackheath, S.E.

1886 MORTON, SHADFORTH, M.D. Durham, Wellesley Villas, Croydon.

1887 MOSELEY, GEORGE WILKINS, M.B., C.M. Ed. (*Travelling*).

1879 MOULLIN, JAMES A. MANSELL, M.A., M.B., Assistant Physician to the Hospital for Women and Children, 69, Wimpole street, Cavendish square, W. *Trans.* 1.

1878 MOWAT, GEORGE, 49, St. Peter street, St. Albans. *Trans.* 1.

1877 MURPHY, JAMES, M.D., Honorary Surgeon to the General Infirmary, Sunderland; Holly House, Sunderland. *Hon. Loc. Sec. Trans.* 1.

1885 MURRAY, CHARLES STORMONT, L.R.C.S. and L.M. Ed., 34, Gloucester place, Portman square, W.

Elected

1887 MURRAY, HORACE H. C., 470, Hornsey road, N.

O.F. MUSGRAVE, JOHNSON THOMAS, L.R.C.P. Ed., Irlam villa, 39, Finchley road, N.W. *Council*, 1859-60. *Trans.* 1.

1888 MYDDELTON-GAVEY, EDWARD HERBERT, 64, St. Matthew's street, Ipswich.

1887 NAPIER, A. D. LEITH, M.D. Aber., 3, Beaufort gardens, S.W.

1863 NASON, JOHN JAMES, M.B. Lond., Church House, Stratford-on-Avon.

1859 NEAL, JAMES, M.D., Barcelona House, Sandown, Isle of Wight.

1882 NESHAM, THOMAS CARGILL, M.D., Lecturer on Midwifery in the University of Durham College of Medicine at Newcastle-on-Tyne; 12, Ellison place, Newcastle-on-Tyne. *Council*, 1889.

1881 NETHERCLIFT, WILLIAM HENRY, Junior Athenæum Club, Piccadilly, W.

1859 NEWMAN, WILLIAM, M.D., Surgeon to the Stamford and Rutland Infirmary; Barn Hill House, Stamford, Lincolnshire. *Council*, 1873-75. *Vice-Pres.* 1876-77. *Trans.* 4.

1873 NICHOLSON, ARTHUR, M.B. Lond., 98, Montpellier road, Brighton.

1879 NICHOLSON, EMILIUS ROWLEY, M.D., 89, Camden road, N.W.

1876 NIX, EDWARD JAMES, M.D., 143, Great Portland street, W. *Council*, 1889.

1882 NORMAN, JOHN EDWARD, Lismore House, Hebburn-on-Tyne.

1883 NUNN, PHILIP W. G., L.R.C.P. Lond., Christchurch road, Bournemouth.

1884 OAKES, ARTHUR, M.D., 99, Priory road, West Hampstead, N.W.

1880 OARLEY, JOHN, Holly House, Wood's End, Halifax, Yorkshire.

1886 OGLE, ARTHUR WESLEY, L.R.C.P. Lond., 90, Cannon street, E.C.

Elected

1876 OGSTON, FRANCIS, M.D., Lecturer on Hygiene and Medical Jurisprudence in the University of Otago; Dunedin, New Zealand (per Richard W. K. Bain, 146, Union street, Aberdeen).

O.F. OLDHAM, HENRY, M.D., F.R.C.P., Consulting Obstetric Physician to Guy's Hospital; 4, Cavendish place, Cavendish square, W. *Vice-Pres.* 1859. *Council*, 1860, 1865-66. *Treas.* 1861-62. *Pres.* 1863-64. *Trans.* 1. *Trustee.*

1888 OLIVER, FRANKLIN HEWITT, L.R.C.P. Lond., 2, Kingsland road, E.

1884 OPENSHAW, THOMAS HORROCKS, M.B., M.S., 21, Gower street, W.C.

1869 ORD, GEORGE RICE, Streatham hill, Surrey. *Council*, 1881.

1880 ORTON, CHARLES, M.D., Nelson place, Newcastle-under-Lyme, Staffordshire.

1877 OSTERLOH, PAUL RUDOLPH, M.D. Leipzic; Dresden.

1863 OSWALD, JAMES WADDELL JEFFRIES, M.D., 245, Kennington road, S.E. *Trans.* 4.

1884 OSWALD, ROBERT JAMES WILLIAM, L.R.C.P., 212, Clapham road, S.W.

1883 PALMER, JOHN IRWIN, 21, Henrietta street, Cavendish square, W.

1877 PALMER, MONTAGU H. C., The Manor House, Newbury.

1886 PAPILLON, THOMAS ALEXANDER, L.R.C.P. Ed., Burley road, Oakham.

1877* PARAMORE, RICHARD, M.D., 18, Hunter street, Brunswick square, W.C.

1867 PARKS, JOHN, Bank House, Manchester road, Bury, Lancashire.

1887 PARSONS, JOHN INGLIS, M.D. Durh., 9, Collingham place, S.W.

1880 PARSONS, SIDNEY, 78, Kensington park road, W.

1865* PATERSON, JAMES, M.D., Hayburn Bank, Partick, Glasgow.

1874 PAYNE, WILLIAM S. HELE, 54, Queen's Road, Peckham, S.E.

Elected

1882* PEACEY, WILLIAM, M.B., 214, Lewisham high road, S.E.

1864 PEARSON, DAVID RITCHIE, M.D., 23, Upper Phillimore place, Kensington, W.

1871 PEDLER, GEORGE HENRY, 6, Trevor terrace, Rutland gate, S.W.

1880 PEDLEY, THOMAS FRANKLIN, M.D., Rangoon, India. *Trans.* 1.

1881 PERIGAL, ARTHUR, M.D., New Barnet, Herts.

1871 PERRIGO, JAMES, M.D., 163, Bleury street, Montreal, Canada. *Hon. Loc. Sec.*

1879* PESIKAKA, HORMASJI DOSABHAI, 23, Hornby row, Bombay.

1883 PETTIFER, EDMUND HENRY, 32, Stoke Newington green, N.

1879 PHIBBS, ROBERT FEATHERSTONE, M.R.C.P. Ed., Pelham House, 30, Elgin avenue, Maida vale, W.

1879 PHILLIPS, GEORGE RICHARD TURNER, 24, Leinster square, Bayswater, W.

1882 PHILLIPS, JOHN, B.A., M.D. Cantab., M.R.C.P., Physician to the British Lying-in Hospital; 125, Harley street, W. *Council*, 1887-89. *Trans.* 4.

1878 PHILPOT, JOSEPH HENRY, M.D., 13, South Eaton place, S.W.

1871 PHILPS, PHILIP GEORGE, 4, Queen's road, Peckham, S.E.

1876 PICARD, P. KIRKPATRICK, M.D., 59, Abbey road, St. John's Wood, N.W.

1874 PIGG, THOMAS, M.D., M.R.C.P., Physician to the Manchester Southern Hospital for Women and Children; 98, Mosley street, Manchester.

1864 PLAYFAIR, W. S., M.D., LL.D., F.R.C.P., Physician Accoucheur to H.I. & R.H. the Duchess of Edinburgh; Professor of Obstetric Medicine in King's College, and Obstetric Physician to King's College Hospital; 31, George street, Hanover Square, W. *Council*, 1867. 1883-5. *Hon. Librarian*, 1868-9. *Hon. Sec.* 1870-72. *Vice-Pres.* 1873-5. *Pres.* 1879-80. *Trans.* 14.

1880 POCOCK, FREDERICK ERNEST, M.D., The Limes, St. Mark's road, Notting hill, W.

Elected

1883 POCOCK, WALTER, Gwydyr House, Brixton hill, S.W.

O.F.* POLLARD, WILLIAM, Surgeon to the Torbay Hospital; Southlands, Torquay, Devon.

1883 POOK, WILLIAM JOHN, L.R.C.P., 2, Hemingford road, N.

1876 POPE, H. CAMPBELL, M.D., F.R.C.S., Broomsgrove Villa, 280, Goldhawk road, Shepherd's Bush, W.

1888 POPHAM, ROBERT BROOKS, L.R.C.P. & S. Ed., 67, Bartholomew road, Camden road, N.W.

1882 PORTER, JOSEPH FRANCIS, M.D., Helmsley, Yorkshire.

1864 POTTER, JOHN BAPTISTE, M.D., F.R.C.P., Obstetric Physician to, and Lecturer on Midwifery and Diseases of Women at, the Westminster Hospital; 20, George street, Hanover square, W. *Council*, 1872-6. *Hon. Lib* 1877-8. *Vice-Pres.* 1879-81. *Treas.* 1882-4. *Board Exam. Midwives*, 1883-4. *Pres.* 1885-6. *Trans.* 1.

1875 POWDRELL, JOHN, 160, Euston road, N.W.

1884 POWELL, JOHN JAMES, L.R.C.P. Lond., Norwood Lodge, Weybridge.

1863 POWELL, JOSIAH T., M.D., 347, City road, E.C.

1885 PRAEGER, EMIL ARNOLD, Nanaimo, British Columbia.

1886 PRANGLEY, HENRY JOHN, L.R.C.P. Lond., 160, Anerley road, Anerley.

1888 PRATT, GEORGE A., Radcliffe Infirmary, Oxford.

1880 PRICKETT, MARMADUKE, M.A. Cantab., M.D., Physician to the Samaritan Hospital; 12, Devonport street, Gloucester square, W.

O.F. PRIESTLEY, WILLIAM O., M.D., LL.D., F.R.C.P., Consulting Obstetric Physician to King's College Hospital; 17, Hertford street, Mayfair, W. *Council*, 1859-61, 1865-66. *Vice-Pres.* 1867-69. *Pres.* 1875-76. *Trans.* 6.

1884 PRONGER, CHARLES ERNEST, L.R.C.P., Litchdon, Barnstaple.

1876 QUIRKE, JOSEPH, L.R.C.P. Ed., The Oaklands, Hunter's lane, Handsworth, Birmingham.

Elected

O.F. RANDALL, JOHN, M.D., Lecturer on Medical Jurisprudence, St. Mary's Hospital Medical School; Medical Officer, St. Marylebone Infirmary; 204, Adelaide road, N.W. *Council*, 1877.

1861 RASCH, ADOLPHUS A. F., M.D., Physician for Diseases of Women to the German Hospital; 7, South street, Finsbury square, E.C. *Council*, 1871-3. *Trans.* 5.

1878 RAWLINGS, JOHN ADAMS, M.R.C.P. Ed., 4, Northampton terrace, Swansea.

1870 RAY, EDWARD REYNOLDS, Dulwich, Surrey, S.E.

1860* RAYNER, JOHN, M.D., Swaledale House, Quadrant road north, Highbury New Park, N.

1879 READ, THOMAS LAURENCE, 11, Petersham terrace, Queen's gate, S.W.

1874 REES, WILLIAM, Priory House, 129, Queen's crescent, Haverstock hill, N.W.

1879 REID, WILLIAM LOUDON, M.D., 7, Royal crescent, Glasgow.

1882 REMFRY, LEONARD, L.R.C.P. Lond., St. George's Hospital, S.W.

1886 RENSHAW, HERBERT SMITH, M.D. St. And., Salebridge house, Sale, Manchester.

1889 RENTOUL, ROBERT REID, M.D., 78, Hartington road Liverpool.

1875* REY, EUGENIO, M.D., 39, Via Cavour, Turin.

1886 RICHARDSON, THOMAS ARTHUR, 26, London road, Croydon.

1872 RICHARDSON, WILLIAM L., M.D., A.M., Professor of Obstetrics in Harvard University; Physician to the Boston Lying-In Hospital; 225, Commonwealth avenue, Boston, Massachusetts, U.S.

1888 RIDING, WILLIAM STEER, M.D. Edin., 25, Endsleigh gardens, N.W.

1872 RIGDEN, GEORGE, Surgeon to the Canterbury Dispensary; 60, Burgate street, Canterbury. *Trans.* 1. *Hon. Loc. Sec.*

Elected

1871 RIGDEN, WALTER, 16, Thurloe place, S.W. *Council*, 1882-3. *Trans.* 1.

O.F.* ROBERTS, DAVID LLOYD, M.D., F.R.C.P., F.R.S. Edin., Obstetric Physician to the Manchester Royal Infirmary; and Lecturer on Clinical Midwifery and the Diseases of Women in Owens College; 11, St. John street, Deansgate, Manchester. *Council*, 1868-70, 1880-2. *Vice-Pres.* 1871-2. *Trans.* 5.

1867 ROBERTS, DAVID W., M.D., 56, Manchester street, Manchester square, W.

1883 ROBERTS, JOHN CORYTON, L.R.C.P. Ed., Avenue House, Peckham Rye, S.E.

1874 ROBERTSON, WILLIAM BORWICK, M.D., St. Anne's, Thurlow park road, West Dulwich, S.E.

1887 ROBINSON, HUGH SHAPTER, L.R.C.P. Ed., 40, North Bridge street, Monkwearmouth, Sunderland.

1884 ROBINSON, LUKE, M.R.C.P. Lond., 217, Geary street, San Francisco, California.

1886 ROE, ARTHUR DUMVILLE, B.A, M.B. Cantab., West hill, Wandsworth, S.W.

1876 ROE, JOHN WITHINGTON, M.D., Ellesmere, Salop.

O.F. ROGERS, WILLIAM RICHARD, M.D., Consulting Physician to the Samaritan Free Hospital for Women and Children; 56, Berners street, Oxford street, W. *Council*, 1870-72. *Trans.* 4.

1874 ROOTS, WILLIAM HENRY, Canbury House, Kingston-on-Thames.

1874 ROPER, ARTHUR, Lewisham hill, Blackheath, S.E. *Council*, 1886-8.

1865 ROPER, GEORGE, M.D., Consulting Physician to the Royal Maternity Charity; 19, Ovington gardens, S.W. *Council*, 1875-77, 1883-5. *Vice-Pres.* 1879-81, 1889, *Board Exam. Midwives*, 1880-1, 1883-5. *Trans.* 10.

1859 ROSE, HENRY COOPER, M.D., Rosslyn hill, Hampstead, N.W. *Council*, 1875-77. *Trans.* 4.

Elected

1887 ROSENAU, ALBERT, M.D., Webergasse, 15, Wiesbaden.

1880 ROSS, DAVID PALMER, M.D., Freetown, Sierra Leone.

1883 ROSSER, WALTER, M.D., 1, Wellesley villas, Croydon.

1884 ROSSITER, GEORGE FREDERICK, M.B., Surgeon to the Weston-super-Mare Hospital; Cairo Lodge, Weston-super-Mare.

1885 ROUGHTON, EDMUND WILKINSON, M.D., 28, Welbeck street, Cavendish square, W.

1884 ROUGHTON, WALTER, L.R.C.P. Lond., Station road, New Barnet.

1882 ROUTH, AMAND, M.D., B.S., Assistant Obstetric Physician to, and Teacher of Practical Obstetrics and Gynæcology at, Charing Cross Hospital; 6, Upper Montagu street, W. *Council*, 1886-8. *Trans.* 1.

O.F. ROUTH, CHARLES HENRY FELIX, M.D., Consulting Physician to the Samaritan Free Hospital for Women and Children; 52, Montagu square, W. *Council*, 1859-61. *Vice-Pres.* 1874-6. *Trans.* 13.

1887 ROWBOTHAM, HERBERT C., Vale House, Melbourne, Derby.

1887* ROWE, ARTHUR WALTON, M.D. Dur., 1, Cecil street, Margate.

1881 ROWORTH, ALFRED THOMAS, Grays, Essex.

1886 RUSHWORTH, FRANK, M.B. Lond., Langdale, Goldhurst terrace, South Hampstead, N.W.

1888 RUSHWORTH, NORMAN, L.R.C.P. Lond., Beechfield, Walton-on-Thames.

1886 RUTHERFOORD, HENRY TROTTER, B.A., M.B. Cantab., 46, Queen Anne street, Cavendish square, W.

1866 SABOIA, Baron V. de, M.D., Director of the School of Medicine, Rio de Janeiro; 34, Rua do Visconde Maranguapo, Rio de Janeiro. (2, Avenue Friedland, Paris.) *Trans.* 2.

1883 SALTER, FRANCIS JOSEPH, L.R.C.P. Ed., 9, Lyddon terrace, Leeds.

1864 SALTER, JOHN H., D'Arcy House, Tolleshunt D'Arcy, Kelvedon, Essex.

Elected

1875* SALZMANN, FREDERICK WILLIAM; Senior Surgeon to the Hospital for Women; 18, Montpellier road, Brighton. *Council*, 1880-2. *Hon. Loc. Sec.*

1868* SAMS, JOHN SUTTON, St. Peter's Lodge, Eltham road, Lee, S.E.

1886 SANDERSON, ROBERT, M.B. Oxon., 99, Western road, Brighton.

1872 SANGSTER, CHARLES, 148, Lambeth road, S.E.

1870 SAUL, WILLIAM, M.D., 44, Bedford square, W.C.

1872 SAVAGE, THOMAS, M.D., Surgeon to the Birmingham and Midland Hospital for Women; 33, Newhall street, Birmingham. *Council*, 1878-80.

1877 SAVORY, CHARLES TOZER, M.D., 6, Douglas road, Canonbury, N. *Trans.* 1.

O.F. SCOTT, JOHN, F.R.C.S., 10, Tavistock square, W.C. *Council*, 1868-70. *Vice-Pres.* 1871-3. *Trans.* 1.

1870 SCOTT, JOHN, M.D., New street, Sandwich.

1888 SCOTT, PATRICK CUMIN, B.A., M.B. Cantab., 38, Shooter's Hill Road, Blackheath, S.E.

1866 SEQUEIRA, JAMES SCOTT, 68, Leman street, Goodman's fields, E., and Crescent House, Cassland Crescent, Cassland road, South Hackney.

1882 SERJEANT, DAVID MAURICE, M.D., 1, The Terrace, Camberwell, S.E.

1875 SETON, DAVID ELPHINSTONE, M.D., 110, Cromwell road, S.W. *Council*, 1884.

1860 SEWELL, CHARLES BRODIE, M.D., 21, Cavendish square, W., and 13, Fenchurch street, E.C. *Council*, 1880-2.

1887 SHANNON, R. ALEXANDER, L.R.C.P. Ed., The Laurels, St. Mary Cray.

O.F. SHARPIN, HENRY WILSON, F.R.C.S., Surgeon to the Bedford General Infirmary, Bedford. *Council*, 1871-3. *Trans.* 1. *Hon. Loc. Sec.*

1887 SHAW, JOHN, M.D. Lond., Obstetric Physician to the North West London Hospital; Burlington House, Willoughby road, Hampstead, N.W. *Trans.* 1.

Elected

1867 SHEPHERD, FREDERICK, L.R.C.P. Ed., 33, King Henry's road, Primrose hill, N.W.

1886 SIMMONS, FOURNESS, M.B. Edin., 30, Albert terrace, Darlinghurst, Sydney, N.S.W.

1874 SINCLAIR, ALEXANDER DOULL, M.D., Consulting Physician to the Boston Lying-in Hospital; 35, Newbury street, Boston, Massachusetts, U.S.

1888 SINCLAIR, WILLIAM JAPP, M.D. Aber., Honorary Physician to the Southern Hospital for Women and Children and Maternity Hospital, Manchester; and Professor of Obstetrics and Gynæcology, Owens College, Manchester; 268, Oxford road, Manchester.

1876 SIRIGNANO, GIOSUE, M.D., 24, Strada Banchi Nuovi, Napoli.

1879 SLIGHT, GEORGE, M.D., 3, Clifford street, Bond street, W.

1881 SLOAN, ARCHIBALD, M.B., 272, Bath street, Glasgow.

1876 SLOAN, SAMUEL, M.D., C.M., 1, Newton terrace, Glasgow.

1861 SLYMAN, WILLIAM DANIEL, 26, Caversham road, Kentish Town, N.W. *Council*, 1881.

1867 SMITH, HEYWOOD, M.D., 18, Harley street, Cavendish square, W. *Council*, 1872-5. *Board Exam. Midwives*, 1874-76. *Trans.* 6.

1888 SMITH, HOWARD LYON, L.R.C.P. Lond.

1875 SMITH, RICHARD THOMAS, M.D., Physician to the Hospital for Women, Soho square; 53, Haverstock hill, N.W.

1886 SMITH, SAMUEL PARSONS, L.K.Q.C.P.I., Park Hyrst. Addiscombe road, Croydon.

1882 SMITH, STEPHEN MABERLY, L.R.C.P. Ed., Yarra street Geelong, Melbourne. [Per Henry M. Smith, 17, St. Bride street, Ludgate circus, E.C.]

1879 SMITH, WM. HUGH MONTGOMERY, L.R.C.P. Ed., 24, London road, West Croydon, Surrey.

1876 SNELL, EDMUND GEORGE CARRUTHERS, 102, Bonner road, Victoria park, E.

Elected

1882 SNELL, GEORGE, L.R.C.P. Ed., Fort Canje, Berbice, B. Guiana.

1889 SOLLY, ERNEST, M.B. Lond., F.R.C.S. Eng., 103, Lambeth Palace road, S.E.

1868 SPAULL, BARNARD E., 1, Stanwick road, West Kensington, W.

1888 SPENCER, HERBERT R., M.D., B.S. Lond., Assistant Obstetric Physician to University College Hospital; 45, Devonshire street, Portland place, W.

1876 SPENCER, LIONEL DIXON, M.D., Bengal Army [care of Messrs. Grindlay and Co., 55, Parliament street].

1882 SPOONER, FREDERICK HENRY, M.D., Maitland Lodge, Clapton, E.

1876 SPURGIN, HERBERT BRANWHITE, 82, Abington street, Northampton.

1884 STANSBY, CHARLES JOHN, M.D., 10, Strand, Derby.

1884 STARKIE, RICHARD FRANCIS, M.D., 47, Sussex street, S.W.

1886 STEAVENSON, WILLIAM EDWARD, M.D. Cantab., M.R.C.P., 39, Welbeck street, W. *Trans.* 1.

1884 STEVENSON, EDMOND SINCLAIR, F.R.C.S. Ed., Strathallan House, Rondebosch, Cape of Good Hope.

1877 STEPHENSON, WILLIAM, M.D., Professor of Midwifery, University of Aberdeen; 297, Union Street, Aberdeen. *Council*, 1881-3. *Vice-Pres.*, 1887-89. *Trans.* 1.

1886 STEWART, EDWARD, M.D. Brussels, 8, Upper Wimpole street, W.

1873 STEWART, JAMES, M.D., 2, Skinner street, Whitby, Yorkshire.

1875* STEWART, WILLIAM, L.R.C.P. Ed., Highfield House, Barnsley, Yorkshire.

1884 STIVEN, EDWARD W. F., M.D., The Manor Lodge, Harrow.

1884 STIVENS, BERTRAM H. LYNE, 11, Kensington gardens square, W.

1883 STOCKS, FREDERICK, 421, Wandsworth road, S.W.

O.F. STOWERS, NOWELL, 166, Clapham road, S.W.

1866 STRANGE, WILLIAM HEATH, M.D., 2, Belsize avenue, Belsize park, N.W. *Council*, 1882-4.

Elected

1871 STURGES, MONTAGUE J., M.D., The Limes, Beckenham, Kent.

1884 SUNDERLAND, SEPTIMUS, M.D., 155, Gloucester road, South Kensington, S.W.

1886 SUTCLIFFE, ARTHUR EDWIN, 345, Stretford road, Manchester.

1883* SUTHERLAND, HENRY, M.A., M.D. Oxon., M.R.C.P., 6, Richmond terrace, Whitehall, S.W.

1862 SUTTON, FIELD FLOWERS, M.D., Balham hill, Clapham, S.W.

1888 SUTTON, JOHN BLAND, F.R.C.S., 22, Gordon street, W.C. *Trans.* 1.

1859 SWAYNE, JOSEPH GRIFFITHS, M.D., Physician-Accoucheur to the Bristol General Hospital; Harewood House, 74, Pembroke road, Clifton, Bristol. *Council*, 1860-61, *Vice-Pres.* 1862-64. *Trans.* 9. *Hon. Loc. Sec.*

1888* SWORN, HENRY GEORGE, L.K.Q.C.P. & L.M., 16, Albion road, Holloway road, N.

1883 TAIT, EDWARD SABINE, M.B., 54, Highbury park, N. *Trans.* 1.

1879 TAIT, EDWARD W., 54, Highbury park, N. *Council*, 1886-7.

1871 TAIT, LAWSON, F.R.C.S., Surgeon to the Birmingham and Midland Hospital for Women; 7, The Crescent, Birmingham. *Trans.* 12.

1880 TAKAKI, KANAHEIRO, F.R.C.S., 10, Nishi-Konyachō, Kiōbashika, Tokio, Japan. *Hon. Loc. Sec.*

1871 TANNER, JOHN, M.D., F.L.S., Physician for Diseases of Women, to the Farringdon General Dispensary; 19, Queen Anne street, Cavendish square, W.

1859 TAPSON, ALFRED JOSEPH, M.B. Lond., 36, Gloucester gardens, Westbourne terrace, W. *Council*, 1862-64.

1863 TAPSON, JOSEPH ALFRED, Surgeon to the Clapham General Dispensary; Holmwood, The Grove, Clapham common, S.W. *Trans.* 1.

1871 TAYLER, FRANCIS T., B.A. Lond., M.B., Claremont villa, 224, Lewisham high road, S.E.

Elected

1869 TAYLOR, JOHN, Earl's Colne, Halstead, Essex.

1871 TAYLOR, JOHN W., M.D., D.Sc., Rothsay House, Prince of Wales terrace, Scarborough. *Hon. Loc. Sec.*

1885 TAYLOR, WILLIAM CHARLES EVERLEY, M.R.C.P. Edin, 34, Queen street, Scarborough.

1884 THOMAS, GEORGE H. W., 9, Courtenay place, Teignmouth.

1887 THOMAS, WILLIAM EDMUND, L.R.C.P. Ed., Bridgend, Glamorganshire.

1882 THOMAS, HUGH, The Grange, Coventry road, Birmingham.

1867 THOMPSON, JOSEPH, L.R.C.P. Lond., 1, Oxford street, Nottingham. *Trans.* 1. *Hon. Loc. Sec.*

1878 THOMSON, DAVID, M.D., 37, Castle street, Luton, Bedfordshire.

1874 THOMSON, WILLIAM SINCLAIR, M.D., C.M., F.R.C.S. Ed., 40, Ladbroke grove, Kensington park gardens, W.

1860 THORNE, GEORGE LEWORTHY, M.B., Cheriton Fitzpaine, Crediton.

1879 THORNTON, J. KNOWSLEY, M.B., C.M., Surgeon to the Samaritan Free Hospital for Women and Children, 22, Portman street, Portman square. *Council*, 1882-3. *Hon. Lib.* 1884-5. *Hon. Sec.* 1886. *Vice-Pres.* 1888. *Trans.* 6.

1874 TICEHURST, AUGUSTUS ROWLAND, Silchester House, Pevensey road, St. Leonard's-on-Sea.

1873 TICEHURST, CHARLES SAGE, Petersfield, Hants.

1866 TILLEY, SAMUEL, The Cedars, Cranford, Middlesex.

O.F. TILT, EDWARD JOHN, M.D., Consulting Physician-Accoucheur to the Farringdon General Dispensary; 27, Seymour street, Portman square, W. *Council*, 1867-68. *Vice-Pres.* 1869-70. *Treas.* 1871-2. *Pres.* 1873-4. *Trans.* 7.

1883 TINKER, FREDERICK HOWARD, F.R.C.P. Ed., Talbot House, Hyde, Cheshire.

1887 TINLEY, THOMAS, M.D. Durh., Hildegard House, Whitby.

Elected

1879 TIVY, WILLIAM JAMES, F.R.C.S. Ed., 8, Lansdown place, Clifton, Bristol.

1872 TOLOTSCHINOFF, N., M.D., Charkoff, Russia.

1869 TOMKINS, CHARLES P., L.K.Q.C.P.I., Beddington park, Croydon.

1884 TRAVERS, WILLIAM, M.D., 2, Phillimore gardens, W.

1873 TREETRAIL, HENRY ERNEST, F.R.C.S. Ed., M.R.C.P. Ed., Walmer House, Victoria road, Aldershot. *Trans.* 1.

1886 TUCKETT, WALTER REGINALD, West Kent General Hospital, Maidstone.

1865 TURNER, JOHN SIDNEY, Stanton House, 81, Anerley road, Upper Norwood.

1881 TUTHILL, PHINEAS BARRETT, M.D., Royal Victoria Hospital, Netley, Southampton.

1861 TWEED, JOHN JAMES, Junr., F.R.C.S., 14, Upper Brook street, W.

1885 UNDERHILL, EDGAR T., M.B. Ed., Bromsgrove.

1874 VENN, ALBERT JOHN, M.D., Obstetric Physician to the Metropolitan Free Hospital; 27, George street, Hanover square, W.

1873 VERLEY, REGINALD LOUIS, F.R.C.P. Ed., 28B, Devonshire street, Portland place, W.

1887 VORES, ARTHUR, Kettering.

1879 WADE, GEORGE HERBERT, Ivy Lodge, Chislehurst, Kent.

1860 WALES, THOMAS GARNEYS, Downham Market, Norfolk.

1866 WALKER, THOMAS JAMES, M.D., Surgeon to the General Infirmary, Peterborough; 33, Westgate, Peterborough. *Council*, 1878-80. *Hon. Loc. Sec.*

1870 WALLACE, FREDERICK, 96, Cazenove road, Upper Clapton, N. *Council*, 1880-2.

1872* WALLACE, JOHN, M.D., Assistant-Physician to the Liverpool Lying-in Hospital; 1, Gambier terrace, Liverpool. *Hon. Loc. Sec. Council*, 1883-5.

Elected

1883 WALLACE, RICHARD UNTHANK, M.B., Cravenhurst, Craven park, Stamford hill, N.

1879* WALTER, WILLIAM, M.A., M.D., Surgeon to St. Mary's Hospital, Manchester; 20, St. John street, Manchester.

1867* WALTERS, JAMES HOPKINS, Senior Assistant Surgeon to the Royal Berkshire Hospital; 15, Friar street, Reading, Berks. *Council*, 1884-6. *Trans.* 1. *Hon. Loc. Sec.*

1873 WALTERS, JOHN, M.B., Church street, Reigate, Surrey.

1886 WARE, GEORGE STEPHEN, L.R.C.P. Lond., Middlesex Hospital, W.

1862 WATKINS, CHARLES STEWART, 16, King William street, Strand, W.C.

1887 WATSON, JOHN ADAM, L.R.C.P. & S. Ed., 39, Dennington park, West Hampstead, N.W.

1884 WATSON, PERCIVAL HUMBLE, L.R.C.P. Lond., 72, Jesmond road, Newcastle-on-Tyne.

1884 WAUGH, ALEXANDER, L.R.C.P. Lond., Midsomer-Norton, Bath.

1867 WEBB, FRED. E., 113, Maida vale, W.

O.F. WEBB, HARRY SPEAKMAN, Welwyn, Herts. *Council*, 1889.

1886 WEBBER, WILLIAM W., L.R.C.P. Ed., Crewkerne.

1884 WEDMORE, ERNEST, M.B. Cantab., Obstetric Physician to the Bristol Royal Infirmary; 11, Richmond Hill, Clifton.

1876 WEIR, ARCHIBALD, M.D., St. Mungho's, Great Malvern.

1867 WELLER, GEORGE, The Mall, Wanstead, Essex.

1887 WELLS, ALBERT PRIMROSE, M.A., L.R.C.P. & S., L.M., Bourneville, School road, Beckenham.

1876 WELLS, FRANK, M.D., Chapel Station, Brookline, Massachusetts.

O.F. WELLS, SIR T. SPENCER, Bart., F.R.C.S., Surgeon in Ordinary to H.M.'s Household; Consulting Surgeon to the Samaritan Free Hospital for Women and Children; 3, Upper Grosvenor street, W. *Council*, 1859. *Vice-Pres.* 1868-70. *Trans.* 5. *Trustee.*

Elected

1886 WEST, CHARLES J., L.R.C.P. Lond., Beaminster, Kempshott road, Streatham Common, S.W.

1888 WESTON, JOSEPH THEOPHILUS, L.K.Q.C.P. & L.M., Muzaffirpur, Tirhút.

1886 WHARRY, ROBERT, M.D. Aber., 6, Gordon square, W.C.

1876 WHARTON, HENRY THORNTON, M.A. Oxford, 39, St. George's road, Kilburn, N.W.

1870 WHEATCROFT, SAMUEL HANSON, L.R.C.P. Ed., Brandsburton, near Hull.

1860 WHEELER, DANIEL, Chelmsford, Essex.

1887 WHITBY, ROBERT, Harlesden, Willesden, N.W.

1882 WHOLEY, THOMAS, M.B. Durh., 49, Milton road, West Kensington park, W.

1883 WICKS, WILLIAM CAIRNS, M.B., South View House, West parade, Newcastle-on-Tyne.

1887 WIGAN, CHARLES ARTHUR, M.B. Dur., Portishead, Somerset.

1877 WIGMORE, WILLIAM, 130, Inverness terrace, Hyde park, W.

1883 WILKINSON, THOMAS MARSHALL, F.R.C.S. Ed., 7, Lindum road, Lincoln.

1879 WILLANS, WILLIAM BLUNDELL, F.R.C.P. Ed., Much Hadham, Herts.

1879 WILLETT, CHARLES VERRALL, 11, Edith road, West Kensington, W.

1887 WILLIAMS, CHARLES ROBERT, M.B., C.M. Ed., 15, Ivanhoe terrace, Ashby de la Zouch.

1872 WILLIAMS, JOHN, M.D., F.R.C.P., Professor of Midwifery in University College, London, and Obstetric Physician to University College Hospital; 11, Queen Anne street, Cavendish square, W. *Council*, 1875-76. *Hon. Sec.* 1877-9. *Vice-Pres.* 1880-2. *Board Exam. Midwives*, 1881-2; *Chairman*, 1884-6. *Pres.* 1887-8. *Trans.* 12.

1886 WILLIAMS, PATRICK WATSON, M.B. Lond., 24, Pembroke road, Clifton.

Elected

1881 WILLIS, JULIAN, M.R.C.P. Ed., 64, Sutherland avenue, Maida vale, W.

1860 WILSON, ROBERT JAMES, F.R.C.P. Ed., 7, Warrior square, St. Leonard's-on-Sea, Sussex. *Hon. Loc. Sec. Vice-Pres.* 1878-80.

1886 WINTERBOTTOM, ARTHUR THOMAS, L.R.C.P. Ed., Worsley road, Swinton, Manchester.

1877 WINTLE, HENRY, M.B., Kingsdown, Church road, Forest hill, S.E.

1887 WITHERS, ROBERT, Lawrence, Otago, New Zealand.

1880 WOODWARD, G. P. M., M.D., 167, Macquarie street, Sydney, New South Wales.

O.F. WORSHIP, J. LUCAS, Manor House, Riverhead, Sevenoaks, Kent. *Council*, 1875-77. *Vice-Pres.* 1883-5. *Trans.* 3.

1881 WORTHINGTON, GEORGE FINCH JENNINGS, M.K.Q.C.P., Highden, Sidcup.

1876 WORTS, EDWIN, 6, Trinity street, Colchester.

1887 WRIGHT, CHARLES JAMES, Surgeon to the Hospital for Women and Children, Leeds; Professor of Midwifery to the Yorkshire College; Lynton Villa, Virginia road, Leeds.

1888 WYATT-SMITH, FRANK, M.B., B.C.Cantab., British Hospital, Buenos Ayres.

1889 WYNTER, ANDREW ELLIS, L.R.C.P.Lond., St. Bartholomew's Hospital, E.C.

1886 WYNTER, WALTER ESSEX, M.B.Lond., B.S., F.R.C.S., 34, Welbeck street, Cavendish square, W.

1871 YARROW, GEORGE EUGENE, M.D., 87, Old street, E.C. *Council*, 1881-3.

1885 YOUNG, ADAM, L.R.C.P.Lond., 34, High street, Sevenoaks.

1882* YOUNG, CHARLES GROVE, M.D., New Amsterdam, Berbice, British Guiana.

1861 YOUNG, WILLIAM BUTLER, 10, Castle street, Reading, Berks.

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OBSTETRICAL SOCIETY

OF

LONDON.

SESSION 1888.

JANUARY 4TH, 1888.

JOHN WILLIAMS, M.D., President, in the Chair.

Present—36 Fellows and 6 Visitors.

Books were presented by Dr. Robert Barnes, Dr. H. Montague Murray, Dr. W. L. Richardson, and the Guy's Hospital Staff.

W. Edmund Thomas, L.R.C.P.Ed. (Bridgend), was declared admitted a Fellow of the Society.

The following gentlemen were elected Fellows of the Society;—Ernest Annacker, M.D.Berl. (Manchester); James Harry Ernest Brock, M.D., B.S.Lond.; James Alexander Fraser, L.R.C.P.Lond. (Romford); Arthur Wilton Galloway, L.R.C.P.Lond.; George John Morgan, L.K.Q.C.P. and L.M. (West Felton); Alexander Morison, M.D.Edin.; Edward Herbert Myddleton-Gavey, M.R.C.S.Eng. (Ipswich); Franklin Hewitt Oliver, L.R.C.P.Lond.; Norman Rushworth, L.R.C.P.Lond. (Walton-on-Thames); Howard Lyon Smith, L.R.C.P.Lond.;

Herbert R. Spencer, M.D., B.S.Lond.; and Henry George Sworn, L.K.Q.C.P. and L.M.

The following gentleman was proposed for election:—James Armstrong, M.B.Edin. (Liverpool).

RUPTURED ABDOMINAL GESTATION CYST.

By Sidney Harvey.

A specimen (post mortem) of ruptured abdominal gestation cyst, attached to right of fundus uteri, right ovary and Fallopian tube apparently healthy, left tube curved backwards and attached by its fimbriated extremity to posterior surface of uterus, beneath the fimbriated extremity the left ovary attached by adhesions (old) to posterior surface of uterus and surrounded by recent clot. Uterine cavity measures 3¼ inches, fœtus measures 4½ inches. The following is history of patient:

S. L—, aged 28, married, two children, aged six and two years. No miscarriages; pregnant about three months. About the end of July, 1887, she had a flooding, lasting till about September 10th, 1887, from which time she dates the commencement of her pregnancy. The menorrhagia ceased without treatment, and pregnancy was accompanied by the usual symptoms. She never had any local pain or discomfort. Patient was seen by a neighbour the day before the illness (December 11th), when she was said to be in good health; the following evening (December 12th), about 10 p.m., she was seized with acute severe pain in "right side of stomach," vomiting, shivering, and faintness. There was no vaginal discharge. Being alone in house, she lay in this condition till next day, December 13th, about noon, when Mr. Loftus and Mr. Jones, of Fulham, were sent for. She was then in a state of profound collapse, face deathly pale, extremities

cold, pulse almost imperceptible. Temperature not rising to 94°, and constant vomiting. Mr. Loftus saw her several times during the day. At 1 a.m. on the 14th he requested me to see her. On my arrival patient was profoundly collapsed, constant vomiting, abdomen distended and tender, dulness extending from midway between crest of right ilium and last rib, taking a semicircular direction to left of symphysis pubis. No distinct tumour to be felt bimanually, owing to distension, uterus enlarged, os slightly patulous and pushed slightly to left, some indistinct fulness to right of uterus. No vaginal discharge. I looked upon the case as one of ruptured extra-uterine gestation, and recommended laparotomy, to which the friends would not consent. The treatment then consisted of 1 gr. of ergotine and ¼ gr. of morphia hypodermically every four hours. The patient gradually sank, and died on the morning of December 14th, about thirty-six hours from commencement of symptoms.

The specimen was referred to a Committee consisting of Drs. Braxton Hicks and Griffith, and Mr. Harvey.

DOUBLE HYDROSALPINX.

By C. H. Carter, M.D.

SPECIMEN OF TUBO-OVARIAN CYST.

By W. S. A. Griffith, M.B.

Dr. W. Griffith exhibited a specimen illustrating the formation of tubo-ovarian cysts, which had been lately removed from the body of a middle-aged woman who had died in St. Bartholomew's Hospital.*

* Mus. spec., No. 2934c.

The uterus was fixed by old membranous adhesions to the rectum, the left Fallopian tube was adherent to the left ovary, its fimbriated extremity was closed, and, being greatly distended with thin fluid, the tube formed a large hydrosalpinx. The left ovary was not cystic.

The right tube was similarly distended, and adhered to the right ovary, which was transformed into a unilocular thin-walled cyst the size of a bantam's egg. A large communication existed between them.

The specimen illustrates the early history of these rare occurrences, and supports the view recently brought forward in a paper on this subject, that tubo-ovarian cysts are rarely, if ever, the result of a communication forming between a tube and a pre-existing ovarian cyst.

SPECIMEN OF CYSTIC ADENOMA OF THE CERVIX.

By W. S. A. Griffith, M.B.

A patient in the third month of her third pregnancy came to St. Bartholomew's Hospital* complaining of "something coming down" to the vulva. This was found to be the anterior lip of the cervix, which was much enlarged, forming a pendulous mass, with its long diameter, measuring 2½ inches, lying in the transverse axis of the vagina. This was removed by the écraseur, and on section was found to be a spongy mass, permeated by cavities distended with the thick tenacious mucus which is like the secretion characteristic of the cervical glands.

On section, the stroma consisted of the mixed muscular and connective tissue of the cervix, and the cavities were lined by a single layer of columnar epithelium, and were identical in structure with Nabothian follicles.

* Mus. spec., 2960ª.

The patient was examined some months after the operation, and the parts appeared to be normal.

Dr. Griffith had hoped to find some description of similar cases, but had not yet succeeded, though the President had told him he had seen a case of this kind.

Fritsch (of Breslau), in his 'Diseases of Women,' 2nd ed., 1884, p. 209, mentions the connection between extensive glandular proliferation of the cervix and pregnancy, but gives no references, and does not write as if he had himself seen a case.

Dr. Carter said that whilst performing Emmet's operation for the repair of the lacerated cervix uteri, he had on several occasions, in paring the hypertrophied and everted edges of the congested labia, cut through cysts which were at least one third of an inch deep from the margins of the labia.

PARAMETRITIS DEXTRA (PURULENT).

By W. S. A. Griffith, M.B.

The specimen* was removed from the body of a woman aged 24, who had been under the care of Dr. Matthews Duncan in St. Bartholomew's Hospital suffering from an irreducible retroversion of the uterus in the fourth month of her first pregnancy, causing prolonged retention of urine, cystitis, and eventually gangrene of the whole bladder.

A mass of adhesions which were recognised during life to the right of the uterus prevented its replacement even after the induction of abortion, which was effected twelve days before her death. At the post-mortem examination these adhesions were found to unite the transverse colon, omentum, and some small intestines, with the bladder and upper and anterior surfaces of the right broad ligament.

The uterus is still large but empty, the left broad liga-

* Mus. spec., No. 2951ᵉ.

ment and appendages are healthy. The right broad ligament is distended with pus and sloughing cellular tissue, extending from the Fallopian tube above to the levator ani below, and from the side of the uterus to the side of the pelvis.

The right ovary is adherent to the posterior surface of the broad ligament; it is suppurating, and communicates with the abscess in the broad ligament.

There are now two large openings of the abscess into the peritoneal cavity on its upper and posterior surfaces, neither of which existed during life, though perforation was imminent at both places, the peritoneum being gangrenous.

The right Fallopian tube is traced with difficulty round the anterior margin of the upper opening; its fimbriated extremity is free at the right extremity of the opening.

The bladder is black and gangrenous throughout its entire thickness. The upper portion of the urethra is greatly dilated.

The parametritis apparently began on the third day after the abortion, when she had a severe rigor and fever followed by a characteristic temperature.

NOTE ON THE POST-MORTEM APPEARANCES OF A PHLEGMON OF THE BROAD LIGAMENT.

By Arthur H. N. Lewers, M.D.Lond.
Assistant Obstetric Physician to the London Hospital.

(Received May 2nd, 1887.)

It is so unusual to have an opportunity of seeing a case of parametritis in the stage of phlegmon in the post-mortem room that I think a description of the appearances presented is worth recording. I hoped to be able to show the specimen, but unfortunately in the hot weather last summer it was spoiled.

S. H—, aged 39, was admitted into the London Hospital a few days after her confinement suffering from mania and parametritis. The physical signs of the parametritis were well marked, there being a well-defined lump in the situation of the right broad ligament displacing the uterus to the opposite side. The patient had also a good deal of bronchitis, and I think her death, which occurred on the tenth day after delivery, was chiefly due to the bronchitis.

On post-mortem examination the layers of peritoneum forming the right broad ligament were found to be separated by exudation between them, so that, from before back, the broad ligament from peritoneal surface to peritoneal surface measured 1½ inches. The separation of the layers of peritoneum forming the right broad ligament began at the lower border of the Fallopian tube and extended downwards as far as the broad ligament extends. Externally the separation by exudation extended to the

pelvic wall. The Fallopian tube was, as it were, stretched over the convex upper surface of the swelling formed by the exudation between the layers of the broad ligament. The surface of the peritoneum over the swelling so formed had not for the most part lost its shiny appearance, but was somewhat granular, and here and there flakes of recent lymph about $\frac{1}{16}$ inch thick or less were adherent to it.

On cutting into the swelling the cut surface had an appearance like that of a somewhat coarse sponge, there being seen holes of various sizes separated from one another by solid tissue. The cavities referred to were filled with a sero-sanguinolent fluid, but none of them contained pus. The largest hole would admit a No. 16 catheter.

The right ovary measured $2\frac{1}{4}$ inches long, $1\frac{1}{4}$ inches high, and $\frac{5}{8}$ inch thick. Its surface was adherent to the adjacent peritoneal surface of the broad ligament by recent lymph. On section the ovary was found to contain an abscess holding about half a drachm of pus. On the left side the broad ligament was normal; having its normal translucency when held up to the light and looked at from before back.

The left ovary was $2\frac{1}{4}$ inches long, $\frac{5}{8}$ inch high, and $\frac{3}{16}$ inch thick. It did not contain the corpus luteum.

The uterus was about $6\frac{3}{8}$ inches long, and measured about $4\frac{1}{2}$ inches between the points of entry of the Fallopian tubes. The placental site was on the posterior wall, and presented a mammillated appearance. Elsewhere the surface of the uterine cavity was nearly smooth.

Remarks.—The specimen, in addition to illustrating a phase of parametritis that is rarely seen post mortem, has also, I think, an interest in relation to the pathology of ovaritis. There was a small abscess in the ovary on the same side as the phlegmon. It is difficult to conceive of ovaritis occurring as a primary affection, while it is easy to see how ovaritis may be secondary. That is to say:

Peri-ovaritis is produced by inflammation having ex-

tended along the Fallopian tube to the pelvic peritoneum producing a pelvic peritonitis involving the ovary.

Interstitial ovaritis may be produced by extension of inflammation from the connective tissue between the layers of peritoneum forming the broad ligament, along the connective tissue in the hilum of the ovary, and so to the parenchyma of the ovary; *i. e.* interstitial ovaritis is secondary to parametritis.

In this specimen, while the inflammation in the broad ligament was still in the stage of phlegmon, the inflammation in the substance of the ovary had gone a stage further, and caused a small abscess.

Dr. MATTHEWS DUNCAN regarded the rare dissection of a broad ligament parametric phlegmon as of very great interest. Dr. T. Keith had mentioned a case of an allied kind observed during ovariotomy; so great was the swelling that he could not pass a sponge into the pelvic excavation. In both Dr. Lewers' case of parametric phlegmon and Dr. Griffith's case of parametric abscess there was room for believing that septicæmia was present; and this might be the explanation of the situation of the disease between the folds of the broad ligament,—a situation which was not common, if, indeed, it occurred at all, in the common simple or traumatic parametric cases. In cases of puerperal septicæmia or pyæmia such phlegmonous masses, as distinguished from abscesses, were not rare. They were generally situated on the limbs and often multiple. They might have various degrees of tenderness, and there might be superficial redness or none. He had seen a case lately on the posterior aspect of the thigh, with redness and with two small, deep, punched-out ulcers, each of the size of a split pea. He had lately seen two such cases of phlegmon when eminent surgeons diagnosed abscess and operated boldly, finding no matter. Such cases, even when accompanied by very bad symptoms, did not all end fatally.

Dr. GRAILY HEWITT thought Dr. Lewers' contribution very valuable. The opportunity of substantiating the actual locality of effusions in this situation rarely offered. He had himself frequently met with cases where the effusion appeared to be in the broad ligament as in Dr. Lewers' case. He was of opinion that the presence of such effusions indicated a localised septicæmia. The septic material entered by way of the lymphatics or by the blood-vessels, and the effusion in the broad ligament was the result.

Dr. CARTER had had an opportunity of being present at the

autopsy of a patient who died of parametritis of septic origin. The broad ligament of one side was much enlarged, and the section presented an appearance as though some plastic matter had been injected between all the parts, separating them from each other, the veins were largely distended, and the lymphatics were embedded in this plastic material, and kept quite fixed and patent.

Dr. LEWERS, in reply, said many known facts favour the view that all cases of parametritis where the local manifestations of disease are considerable (as in the specimen described in the paper) are of septic origin, and not due to traumatism alone. In operations on the cervix, *e.g.* the supravaginal amputation of the cervix, there was often considerable traumatism—the connective tissue round the cervix being extensively opened up—yet if the surfaces were made perfectly clean (aseptic) before commencing the operation, and kept clean afterwards, no parametritis, or at least none sufficient to produce either symptoms or physical signs, resulted.

SCARLATINA DURING PREGNANCY AND IN THE PUERPERAL STATE.

By Robert Boxall, M.D., M.R.C.P.,

Visiting Physician to the General Lying-in Hospital, Physician to the Samaritan Free Hospital.

(Received 1st July, 1887.)

(*Abstract.*)

The author briefly refers to some of the anomalies which exist in ordinary scarlatina, and suggests that further deviations from the usual type may be expected under the special conditions which appertain to pregnancy and to the puerperal state.

He mentions some of the more recent literature on the subject as containing the varied and frequently diametrically opposed opinions expressed by different observers, and, in passing, draws attention to the confusion which has arisen through the loose application of the terms "puerperal fever" and "puerperal scarlatina."

He then describes a series of sixteen cases of undoubted scarlatina occurring during pregnancy and in the puerperal state, with special reference to the facts of exposure as far as they could be ascertained in each case. The clinical history of the same cases is presented in a tabular form for further consideration.

Though many contributions have been made on the subject of scarlatina in pregnancy and the puerperal state, our knowledge of the affection, as it occurs under such conditions, is very far from complete. Indeed, upon several points opinions are singularly at variance.

That such should be the case is not a matter for surprise considering that ordinary scarlet fever is by no means a constant factor, for, altogether apart from pregnancy

and the puerperal state, scarlatina presents considerable variety of type, and masked forms of the affection are occasionally encountered. Sometimes, indeed, the patient is struck down at the outset, apparently overcome by the severity of the poison before the usual manifestations of the disease have had time to develop; at others, the general symptoms and characteristic signs are so slight and evanescent that the attack may pass unnoticed; and in a few cases, the fever, the eruption, and even the sore-throat may be altogether absent. Between these extremes every degree of intensity may be met with. Nor is this all. The epidemic constitution is liable to great variation—the virulence of the poison seems much greater in some epidemics than others. Some families and individuals, moreover, present a marked predisposition to the disease (a predisposition which may only appear at certain times and under certain conditions), while others manifestly possess a strong power of resistance to infection. The poison again, whatever be its precise nature, finds a vehicle of infection in the many and diverse surroundings of the patient, and is in consequence often derived from a quarter and in a manner which is not only least expected, but which also frequently baffles detection.

When, in addition, it is remembered that during pregnancy and in the puerperal state, important changes take place in the economy, some ground is afforded for anticipating further deviation from the usual type.

To offer a complete bibliographical review of the subject is beyond the scope of the present communication, but I will endeavour to take up the threads (somewhat tangled threads it must be admitted) where others have left them, and attempt to unravel the skein.

Hervieux, in his 'Traité Clinique et Pratique des Maladies Puerpérales,' published in 1870, devotes a chapter to scarlatina and miliaria, wherein will be found a very excellent description of the affection, together with a retrospect covering the preceding sixty years.

In 1871, Braxton Hicks, in a valuable paper entitled

"A Contribution to our Knowledge of Puerperal Diseases," brought the subject prominently before this Society. In that communication he gives short notes of eighty-nine cases of severe constitutional disease following delivery, all of which were met with in consultation, but while thirty-seven of that number had been more or less directly exposed to the scarlatinal poison, twenty only showed the usual scarlatinal eruption.

In 1875, led by Spencer Wells and continued throughout four meetings of this Society, occurred a memorable discussion "On the Relation of Puerperal Fever to the Infectious Diseases and Pyæmia." Again the subject of scarlatina in pregnant and lying-in women was vigorously debated by numerous speakers.

In the following year, Olshausen published in the 'Archiv fur Gynäkologie,' a valuable treatise on the same subject. In addition to epitomising the work of previous authors, he relates five instances of the affection which came under his own observation, and gives an exhaustive summary of 141 cases reported by various observers.

Lastly, Galabin, in his 'Manual of Midwifery,' which appeared last year, in the chapter on "Puerperal Fevers," enters somewhat fully into the subject, and bases his conclusions largely on the evidence afforded by the 'Collective Investigation Record' of 1884.

The above references comprise but a very small proportion of the sum total which of late years has been published, but therein will be found enumerated the opinions at present in vogue. On many points these opinions are singularly divergent.

Before proceeding further, however, I would pause to define the meaning I here attach respectively to "puerperal fever" and to "puerperal scarlatina." To the use of both terms much latitude has been granted, and I think that much confusion would be saved, if, by mutual consent, both could be entirely discarded. But, failing that, it is necessary to define them. I use the term "*puerperal fever*" in the limited sense of puerperal septicæmia and pyæmia,

i. e. a constitutional disturbance frequently attended by local lesions, *the result of septic poison and of septic poison only*. By "*puerperal scarlatina*," on the other hand, I refer to a constitutional disturbance, occurring during the puerperal state, *the result of scarlatinal poison, and of scarlatinal poison only*. Thus, under the former are not included cases of scarlet fever, whether attended by characteristic symptoms or not, any more than cases of phthisis or other constitutional disturbance, which is not produced *directly* by the septic poison; and under the latter are not included cases of septicæmia attended by a scarlatiniform eruption when such eruption is either a pure epiphenomenon or possibly a manifestation of septic but *not* of scarlatinal poison.

An endeavour has been made to limit the term "puerperal scarlatina" to cases of septicæmia in which a scarlatiniform eruption makes its appearance. Against such an abuse of the term I wish to register an emphatic protest. The eruption of scarlet fever, it must be remembered, is but one symptom out of many which mark the disease as ordinarily met with. The presence of a scarlatiniform rash, however well developed, when unattended with other symptoms, cannot, therefore, be taken to indicate scarlatina with any greater justice than could an ordinary sore-throat. Both of these symptoms may be produced by causes other than scarlatina, and a scarlatiniform eruption is by no means an uncommon form of rash in lying-in women. Such cases may be at once eliminated from the category of scarlatina in the puerperal state.

I now pass to an enumeration of the various views which are held on the subject. The following three propositions give a key to the main points of contention. There are other points of interest, arising out of these, to which I shall have occasion to refer later on.

Infection by the poison of scarlet fever either during pregnancy, during labour, or during the lying-in period is followed in the puerpera—

1. By scarlatina, presenting for the most part the usual

symptoms, *e. g.* rash, sore-throat, and running the ordinary course of the disease.

2. By scarlatina, presenting for the most part the usual symptoms and running the ordinary course of the disease, but associated with local and general lesions, *e. g.* metritis, cellulitis, peritonitis, pyæmia, such as are produced by ordinary septic poison.

3. By scarlatina, in which all the usual symptoms of the disease are absent, but in which local and general lesions such as are produced by ordinary septic poison are present; in a word, infection by the poison of scarlet fever is followed by a disease *clinically* indistinguishable from puerperal septicæmia, or from puerperal fever (as above defined).

To avoid misapprehension, I have made use of the definite expression, "infection by the poison of scarlet fever," and not "exposure to cases of scarlatina," for, in the first place, as Trousseau has so graphically pointed out, "contact et inoculation sont deux faits très différents." Exposure by no means necessarily implies infection; and, secondly, exposure to cases of scarlatina does not limit the possibility of infection to the scarlatinal poison alone; other poisons, not themselves scarlatinal, may possibly be derived from the same case. I need but instance the occasional association of diphtheria with scarlatina in the same subject, in order to make my meaning clear. By exposure to one and the same case, one person may derive scarlatinal infection, another diphtheritic, the former failing with ordinary scarlatina, the latter with undoubted diphtheria. Another person, again, may by similar exposure derive the dual infection, and be attacked both by scarlatina and diphtheria. The same remark applies to the occurrence of septic processes in patients who are the subjects of scarlatina.

In addition to the broader question of the effect of the scarlatinal poison on the pregnant and puerperal woman, the main points of interest to which I would direct the attention of the Society are briefly these. Firstly, as regards infection—

(1) The liability of the pregnant and parturient woman to scarlatinal infection.

(2) The point of entrance of the poison into the system.

(3) The duration of the incubation period.

Secondly, with reference to the course of the declared disease—

(1) The character of the manifestations ordinarily regarded as the effect of the scarlatinal poison—the general condition of the patient, the eruption, the tongue, the sore-throat; albuminuria, rheumatism, secondary throat and other complications.

(2) Its effect on the labour, especially as regards the liability to premature delivery and to inertia..

(3) Its effect on the puerperium, especially as regards the uterus, the lochia, and the mammary secretion.

(4) Its relation to lesions commonly regarded as the manifestations of septic poison; in other words, the relation of scarlatina to puerperal septicæmia.

(5) And lastly, the treatment of scarlatina during pregnancy and in the puerperal state.

I would draw the attention of the Society to the annexed cases of scarlatina, sixteen in number, all of which came under my personal observation at the General Lying-in Hospital, to which they were admitted under the care of Dr. John Williams and Dr. Champneys. To those gentlemen I am deeply indebted for their kind permission to make use of the reports. It has been my endeavour to present in a tabular form a picture of each case, as complete as possible, without being too prolix. Many of the later ones passed early from my personal observation, having been transferred in the early stages of the disease to the Hospital of the Metropolitan Asylums Board at Stockwell. My thanks are largely due to Dr. MacKellar, the Medical Superintendent of that institution, for much of the information which I am able to afford of their subsequent history. The majority of the patients I have also interviewed after their recovery.

My connection with the General Lying-in Hospital, as

house physician, commenced on September 18th, 1883. From that time until the following Christmas, no case of scarlatina occurred among the eighty-two patients admitted.

Case I.—An unmarried girl was admitted on December 26th, 1883, and delivered naturally on the same date. Ninety-eight hours after delivery she failed with scarlatina, presenting the usual symptoms. The attack ran a mild course, and the patient was discharged on the fifteenth day of the puerperium, no desquamation being then observed, though as early as the thirteenth day a note was made that the skin felt "perhaps a little harsh." Until certain facts transpired, subsequent to the patient's discharge from the hospital, the case was not diagnosed as scarlatina, and consequently no measures, beyond those generally employed in the hospital, were taken to secure perfect isolation. The girl came direct to the hospital from a Mission Home for single women in Pimlico. There she had been practically isolated from the outer world for seven weeks previous to delivery. It was difficult to conceive how she could have become infected; and, even if exposure had occurred in the Home, it was reasonable to expect that the source could have been traced without much difficulty. The complexion of the case from the very outset was so suspicious that particular and minute inquiries were made of the authorities. These inquiries resulted in an assurance that no illness of any kind had occurred in the Home, and that no one with whom the girl had been brought into contact had suffered from eruption (except the Matron from an attack of scabies), sore-throat, or general malaise. I shall have occasion to revert to this point in connection with Case III.

Between the above and the following case sixteen patients were admitted.

Case II.—A widow was admitted on January 13th, 1884, and delivered naturally on the same date. Forty-

five hours after delivery she failed with scarlatina of exceptionally mild type. The attack was ushered in by disturbed sleep; slight malaise followed. The temperature never rose above 100°. The rash was well developed, but no sore-throat was observed. Albuminuria was present throughout; the patient was suffering from some anasarca on admission, and for years had evidently been the subject of chronic renal trouble. On the ninth day of lying-in the cervical glands became enlarged and painful. No desquamation was apparent when the patient was discharged on the fourteenth day. The diagnosis of scarlatina was not rendered complete until a month after the patient had left the hospital, when it was ascertained that general desquamation had followed, and traces of it were then still apparent. No special steps were taken to insure perfect isolation. No direct source of infection could be ascertained. The patient, however, came to the hospital from a part of London where a mild epidemic of scarlatina was prevailing. No special connection could be traced between this case and the preceding, or between it and any of the following.

Two patients were admitted between Cases II and III.

Case III.—An unmarried girl, coming direct from the same Mission Home as the patient in Case I, was admitted on January 14th, and delivered naturally on the following day. Fifty-nine hours after delivery she failed with scarlatina. The symptoms were well marked from the very outset. The case was complicated by the occurrence of pleurisy on the sixth and of nephritis on the thirteenth day after delivery. Signs of slight pelvic peritonitis were present from the third to the ninth day of the puerperium. Signs of general peritonitis in association with parametritis made their appearance on the twelfth day.* The constitutional disturbance was con-

* McClintock relates two cases in which peritonitis set in after the commencement of desquamation on the tenth and eleventh days of the puerperum respectively. In both cases a fatal issue occurred within the next two days. A similar case is related by A. Martin (Berlin).

siderable. The desquamation which followed was exceptionally profuse.

It is now possible to complete the diagnosis of Case I, and to trace the connection existing between that, which was a slight case, and the present, a well-marked instance of the affection. Both patients came from the same Mission Home. Communication was now reopened with the authorities, but no clue to the source of infection was obtained until February 4th, when on visiting the Home, I found the patient, the subject of Case I, desquamating about the feet and ankles. As in Case II, no attention had been paid to my injunction, when the patient left the hospital, to be on the look-out for desquamation, and, if any occurred, to notify the fact to me on the postcard with which every patient is provided on her discharge. On the same date (February 4th) a letter was received from the Sister Superintendent of the Home giving the following particulars, which afford a very complete and interesting explanation of the facts:—"In December a young woman with a child, named Frances, was received into the Home from a lodging. She felt poorly for some days, and about December 18th developed bad sore-throat and an attack of some sort, accompanied by thumping headache, great prostration, and a very coated tongue. At these symptoms alarm was aroused, and scarlet fever suspected. No rash was observed. The young woman was feverish and very poorly for three or four days. A doctor was called in, the patient was isolated and kept in bed for a week. During this period the Matron took charge of her, but the child was sometimes with her and sometimes with the other inmates of the Home. The patient, the subject of Case I, more especially acted as nurse to the infant. The illness was finally set down as a 'bilious attack,' isolation was abolished, the girl came downstairs again on Christmas Eve, and from that time mixed freely with the other inmates till she left the Home a week later. During this time (the patient, the subject of Case III), cleaned the bedroom where the girl had been

isolated, occupied the adjoining room, and was more in contact with her than any of the others." The following dates have an important bearing on the etiology of these cases. I shall have occasion to refer later on to another patient marked Z—, also an inmate of the Home, in connection with the lying-in cases known to have been exposed to scarlatina (see tabulated series, Case *XII infra*).

December 18th.—Frances failed in the Home and was isolated.

24th.—Frances mixed with the other inmates.

26th.—Case I left the Home for the hospital.

30th.—Case I failed with scarlatina.

31st.—Frances left the Home.

January 9th.—Case I returned to the Home.

13th.—Z— left the Home for the hospital.

14th.—Case III left the Home for the hospital.

17th.—Case III failed with scarlatina.

19th.—Z— had a sudden rise of temperature.

No disinfection was carried out in the Home till after February 4th. The above facts speak for themselves. It is evident (1) that Case I, in addition to contact with the child and with the matron (both of whom may have disseminated the scarlatinal poison during the period the patient was isolated), was also in direct communication with Frances for two days immediately preceding delivery; (2) that Case III and Z— were both similarly exposed and were in direct contact with Frances for an additional period of five days; (3) in addition to which both were exposed in direct contact with Case I after return to the Home, the former for four, the latter for five days immediately preceding delivery.

The diagnosis of Case III was made at the outset, and consequently means were at once taken to isolate the lying-in ward occupied by the patient Z— and another, and subsequently (June 29th) Case III was isolated in a separate ward.

The three cases which follow are linked together by a common source of infection outside the hospital, but no

special connection can be traced between any of them and any of those which have been related, or of those which follow.

Between Cases III and IV five patients were admitted.

Case IV.—An unmarried girl was admitted on January 29th and delivered naturally on the same day. Seventy-four hours after delivery she failed with scarlatina of mild type. The affection presented the usual symptoms. Slight albuminuria occurred on the twelfth day of the puerperium. Powdery desquamation followed.

Between Cases IV and V three patients were admitted.

Case V.—An unmarried girl was admitted on January 31st and delivered naturally on the same day. Ninety-seven hours after delivery she failed with scarlatina. The symptoms were well marked, but the disease ran a benign course. Slight albuminuria and rheumatism appeared simultaneously on the fourteenth day of the puerperium. Scaly desquamation followed.

Case VI.—An unmarried girl was admitted at the same time as the preceding, on January 31st, and delivered naturally on the same day. One hundred and twenty-four hours after labour she failed with scarlatina. The symptoms were very well marked. Slight albuminuria set in on the seventh day of the puerperium and persisted for about a fortnight. Scaly desquamation occurred.

These three patients had for some weeks been living in the house of a midwife awaiting their admission to the hospital. This midwife had on January 26th delivered a personal friend, three of whose children were convalescent from an attack of scarlet fever, and one of them was desquamating at the time. The mother, I may add, was not affected and made a good recovery from her confinement. For five or six days following this woman's delivery the midwife had spent the evening in this infected

house, and in the very room where the child was peeling. From this house she was fetched to bring each of the girls to the hospital when taken in labour. On each occasion she accompanied them in a cab, and one of them on the way she subjected to a vaginal examination to make sure that labour had set in. It is not possible to conceive that infection could have been passed on from one to another in the hospital, for though the first and second were delivered in the same labour ward the third was confined in a separate one. Each of these patients after delivery occupied separate lying-in wards and failed with scarlatina, the first on February 1st, the second on the 4th, and the third on the 5th, *i. e.* three, four, and five days after admission respectively. Subsequently (February 6th) they were all isolated in one ward, and a sheet kept saturated with carbolic lotion (1 in 20) suspended over the doorway.

Between Cases VI and VII eight patients were admitted, and obviously no connection can be established between any of the preceding and the following case.

Case VII.—Scarlet fever during pregnancy. An unmarried girl was admitted on February 7th. The infectious character of the case was at once recognised. The membranes had ruptured, the liquor amnii had escaped, a forearm presented, the vagina was very narrow. The patient was evidently ill. Face pale and pasty. Lips covered with sordes. Tongue red, irritable, and overclean. Breath offensive. Throat dry and coated with brown secretion. Trunk and lower extremities covered with scarlatiniform rash. However, the circumstances of the case left no alternative but to admit her. Delivery was effected by turning under chloroform. Much difficulty was experienced owing to narrowness of the vagina. The child died during labour. It was apparently about a month premature.

According to the girl's statement she had been quite well till January 30th. On that date, *i. e.* nine days before

delivery, she was seized with the usual symptoms of scarlet fever of moderate intensity. A diagnosis of scarlatina was made on admission, and the medical man who had been called in on February 1st was communicated with. In reply he sent word that "as the patient did not seem particularly ill, he had attributed the rash to drinking bad water," and significantly added that "he had three or four other patients similarly affected in his practice!" This patient, previous to admission, had been occupying a lodging in Pimlico. No clue to any direct exposure could be found. After labour the patient was isolated in a ward with Case III, and immediate measures were taken to disinfect not only the labour ward but also all those who had been in attendance on the case.

In addition to slight secondary throat present during labour, and slight albuminuria from the eleventh to the fourteenth day of the puerperium, the patient was attacked five weeks after delivery with acute nephritis, dropsy, uræmia, vomiting, and convulsions. Desquamation commenced six days after delivery, at first in the form of fine scales, but subsequently the epidermis separated in flakes.

On February 16th five of the cases above related (III, IV, V, VI, VII) were transferred to the Stockwell Fever Hospital on the thirty-third, nineteenth, seventeenth, seventeenth, and tenth day of the puerperium respectively. Admissions to the hospital had been stopped since February 7th. Each ward, whether it had previously contained scarlatinal patients or not, as soon as vacated, was fumigated and washed, the bedding, &c., "stoved." All the staff took carbolic baths, changed their clothing, and had their clothes "stoved." It was not until these measures had been carried out that patients were again admitted.

In this place I may add that during the whole of this period it was the rule to fumigate with sulphur and subsequently to wash with carbolic solution (1 in 20) each labour ward after every six deliveries, and each lying-in ward as soon as vacated by every second set of three

patients. All the mattresses and bedding after use were first fumigated in the wards and then "stoved" at 120° F. Each patient on admission, and each infant, was provided by the hospital with clothes which after coming from the laundry had been "stoved." To insure free ventilation all the windows in each ward were kept permanently open at least six inches at the top, and a fire was maintained in an open grate, night and day, winter and summer. Many other little but important points of detail, which I need not specialise, were studiously carried out, but speaking generally I may say that every patient, no matter what her condition, was looked upon as a possible source of infection to every other patient in the institution, and treated accordingly. The hands and all instruments, &c., before being brought into contact with the patient were, after washing, soaked in carbolic solution (1 in 20). In the delivery rooms a vaginal douche of carbolic solution (1 in 40) was given both before and after labour; and in the lying-in wards a Condy douche was administered morning and evening until the lochia ceased.

Admissions recommenced on February 21st, and between that date and Case VIII, eighteen patients were admitted.

Case VIII.—Scarlatina developed before delivery. An unmarried girl was admitted on March 13th, and was delivered on the following day. Forceps was applied to the head at the outlet for premature detachment of the placenta. On admission, the patient was slightly delirious, a faint scarlatiniform eruption was apparent on the back and abdomen, the cervical glands were shotty.

According to the girl's account, for some days previous to admission she had had malaise, anorexia, lassitude and pains in the limbs, and two days before delivery (March 12th) sore-throat and nausea. This was followed next day by a slight rigor and the usual symptoms of scarlatina. The disease ran a mild course. General desquamation followed (powdery).

No direct source of infection could be ascertained, but

many mild cases of scarlatina were prevalent in the neighbourhood of her home, whence she came direct to the hospital.

A diagnosis of scarlatina was made on admission, and twenty-four hours after labour the patient was transferred direct from the labour ward to Stockwell Fever Hospital. Immediate steps were taken to insure disinfection both of the ward and of all those who had been of necessity brought into contact with the patient.

Between Cases VIII and IX, thirty patients were admitted.

Case IX.—A married woman was admitted on April 20th, and delivered naturally on the following day. Fifty-eight hours after delivery she failed with scarlatina, presenting the usual symptoms. Powdery desquamation followed.

In this case also no direct source of infection could be ascertained, but a mild epidemic of scarlatina was prevalent in the district from which she came.

A diagnosis of scarlatina was made on the second day of the eruption, and the patient was at once transferred to Stockwell Fever Hospital. Despite the fact that immediate steps were taken to insure disinfection, the three cases which follow appear to have derived the disease from this patient, though the channel through which the infection was carried is not apparent.

Following Case IX five patients were admitted who escaped infection, and then three in succession who failed with scarlatina within a few hours of each other.

Case X.—A married woman was admitted on April 25th, and delivered naturally on the same date. Seventy-two hours after delivery she failed with scarlatina of exceptionally mild type. Though the temperature did not rise, at the outset the pulse-beat suddenly increased from 64 to 80. In other respects the symptoms were of the usual character. Powdery desquamation occurred.

Taken in conjunction with the two cases which follow, there can be but little doubt that the disease had its origin in each from the same source within the hospital, though, as it subsequently transpired, a child living four doors from this patient's house had been sent to Stockwell with scarlet fever about a week before she was admitted to the General Lying-in Hospital. Thus, though the possibility of infection before admission cannot be entirely excluded, it is more than possible that infection was derived from the preceding case, which had been admitted five days before, and failed with scarlatina three days after admission. Both were delivered in the same labour ward, and attended by the same midwives, without any special means having at that time been adopted to prevent the spread of infection. Indeed, the nature of the illness in Case IX had not at that time become apparent. Two facts, however, militate against the idea that the patient derived the infection in the labour ward, for in the first place, of the five patients admitted between Case IX and the present one, all had been attended by the same midwives, and four out of their number had been delivered in the same ward, yet none of them took scarlatina; and, in the second place, with regard to the two cases of scarlatina which follow, one patient was delivered in the same labour ward *after* it had been fumigated and cleaned, and the other in a different labour ward altogether. Moreover, the mere fact that the three patients who were occupying the same lying-in ward all failed with scarlatina within a space of less than twenty-four hours, points to some common vehicle of infection introduced into that ward. What that vehicle of infection may have been I am unable to say. Possibly the same night nurse who was in charge of the two wards, that occupied by Case IX and that by Cases X, XI, and XII, may, in passing between the two, have carried the contagion from one to the other.

Case XI.—An unmarried girl was admitted on April 26th, and delivered, about a fortnight before term, on the

same date. A labial abscess had been incised on the previous day. She failed with scarlatina sixty hours after delivery. The disease presented the usual symptoms, and ran an uncomplicated course. General desquamation occurred, the epidermis separating in flakes.

Case XII.—A married woman was admitted on April 27th, and delivered naturally on the same date. Fifty-one hours after delivery she failed with a well-defined attack of scarlatina which ran a benign course. Desquamation followed.

These three patients were all transferred to Stockwell Fever Hospital on May 1st. Admissions were stopped from that date until May 13th, an interval which again allowed all the wards to be cleaned, and all the patients then lying-in to be discharged, before any new patient was received into hospital. At this time also corrosive sublimate was substituted, not only for carbolic acid as a disinfectant for the hands and instruments (1 in 1000), but was given in the form of douche (1 in 2000) both before and after labour in place of carbolic acid in the labour wards, and of Condy's fluid in the lying-in wards.

From this time till the next case occurred twenty-seven patients were admitted. Obviously no connection exists between Case XIII and any of the foregoing.

Case XIII.—Scarlatina setting in during labour. A married woman was admitted on June 10th and delivered on the same date. On admission, the patient was semi-delirious, and complained of chilliness. The pains were feeble throughout the labour, and the peculiar faint smell, resembling that which occurred in two previous cases, was again noticed. The temperature had risen to 100·8° two hours after labour, and next morning reached 101°. Complaint was made of frontal headache and sleeplessness. Flushing of the face with well-developed eruption followed next day. The disease ran a mild course. Desquamation occurred.

No direct source of infection could be ascertained, but scarlatina prevailed in the neighbourhood.

The general condition of the patient during and immediately after labour, and the peculiar faint odour similar to that observed in previous cases, raised suspicions of scarlatina at the outset, and isolation and disinfection were at once carried out. A diagnosis of scarlatina was made on the appearance of the eruption, and the patient was transferred to Stockwell Fever Hospital on the same day.

Between Cases XIII and XIV, 162 patients were admitted, and for five months the Hospital was free from scarlatina.

Case XIV.—Scarlatina occurring a few hours after labour. A married woman was admitted on November 12th, and though suffering at the time from pleuritic effusion on the right side, was delivered naturally on the same date, though probably a few days before the full time of pregnancy. Eight hours after labour she failed with scarlatina, presenting the usual symptoms and well-developed eruption. The disease ran its usual course, and desquamation followed, but, probably owing to the antecedent condition of the chest, recovery was retarded. This patient died about a year later, after operation for double ovarian tumour.

No direct source of infection could be ascertained, nor was scarlatina known to prevail in the district at the time.

A diagnosis of scarlatina was made on the appearance of the eruption three days after delivery, and the patient was at once transferred to Stockwell Fever Hospital. Immediate steps were taken to insure thorough disinfection.

No connection can be traced between this and either of the two cases which follow; but between Cases XV and XVI a distinct link of connection exists.

Between Cases XIV and XV, six patients were admitted.

Case XV.—Scarlatina a fortnight after delivery. A married woman was admitted on November 23rd, and delivered naturally on the following day. Thirteen days after delivery she failed with scarlatina, presenting the usual symptoms. The disease ran an uncomplicated course, with the exception of a slight feverish attack, accompanied by headache and swelling of the feet, and attributed to a chill taken five weeks after delivery. Scaly desquamation followed.

A diagnosis of scarlatina was made when the rash appeared, and the patient was transferred next day to the Stockwell Fever Hospital.

Case XVI.—Scarlatina about a week before delivery. A married woman was admitted the day after the preceding case, and delivered on the same day (November 24th) during the thirty-fourth week of gestation. The fœtus was partially macerated, emitted a peculiar fœtor, and the epidermis was detached in patches.

For about a week previously this patient had been ailing but not confined to bed, and no rash had been observed. On admission, however, some bronzing of the skin was observed in the lumbar region, and was attributed at the time to a syphilitic roseola. On the third day the breasts became distended, and some difficulty was experienced in relieving the bowels. The temperature rose to 101°, but fell immediately the enema acted, and subsequently remained normal. Involution was somewhat retarded, otherwise nothing worthy of note occurred until the patient's discharge.

It is important to note that she had throughout the puerperium occupied the same ward as the previous patient, sleeping in the adjoining bed. When the latter failed with scarlatina, this patient, in order that she might run no risk of infection, was immediately transferred to the isolation ward, pending her discharge on the following day. When dressing to leave the hospital, she remarked on the condition of her skin. She was then

desquamating freely, evidently as the result of a scarlatinal attack occurring before delivery, the nature of which, however, until then was never suspected. No source of infection could be ascertained. The usual steps were taken to prevent the spread of the disease.

From this time until the end of the year, 43 patients were admitted, but no cases of scarlatina occurred.

To sum up then—between September 18th, 1883, and December 31st, 1884, 423 patients were admitted. Sixteen of these were attacked by undoubted scarlatina. The majority of these cases occurred in the early months of 1884, at which time an epidemic was prevalent in the South of London. Of this number, 5 were known to have been exposed to infection prior to admission and before the onset of labour. In addition to these, 5 others failed with scarlatina before admission, or so soon after delivery that, though no precise exposure could be discovered, infection may justly be regarded as having been derived from some source outside the hospital. Of the 6 cases which remain, 4 undoubtedly took the disease after admission to the hospital (though one of them had also been indirectly exposed before labour), and the two remaining cases may be regarded as doubtful.

TABULATED SERIES OF SIXTEEN CASES OF SCARLATINA.

Tabulated Series of Sixte

NOTE.—The numbers, i, ii, iii, &c., refer to the day of the puerperium. The days a
removed from delivery-room to lying-in ward two hours after) the first a
second day of the puerperium

No. of Case.	Date of admission.	Labour.	General condition and previous illness.	Initial symptoms.	Eruption.	Tongue, throat, c cervical glands.
I (Hosp. Rep., 334)	J. F., single, æt. 22. 1-para. Abort. 0. Admitted 26th Dec., 1883, 4.40 p.m. Delivered 26th Dec., 5 40 p.m. Failed 30th Dec.	Delivered at term *(289 + 5 days—reputed from coitus, Mar. 28th =273 days). Natural labour—8¼ hours. Pains normal throughout, but patient rolled about much and was difficult to manage. No laceration. Loss 3 oz.	General health good. Scarlatina when quite young. Subject to attacks of nettle-rash at 13–15 years	vi (31st Dec.): Chills, slight frontal headache, depression of spirits, flushed face	iv (29th Dec.): Papular itching eruption over upper and inner part of thighs, more irritable on v, and disappearing on vi, but more pronounced again on vii. vii: Scalatiniform on chest and thighs. On following day well developed and general, except below elbows and knees and in umbilical region of abdomen; blotchy on rest of abdomen. Faded on ix, and disappeared following day. xii: Faint papular and blotchy eruption appeared on abdomen and inner side of thighs; lasted one day only	Tongue norm throughout. O throat felt slig sore and on follo day subjective s ness had disappea but tonsils slig swollen and co ed. Glands no fected
II (Hosp. Rep., 12)	Mrs. P., widow, æt. 32. 7-para. Abort. 1 at 3 months. Admitted 13th Jan., 1884, 1.45 p.m. Delivered 13th Jan., 2.15 p.m. Failed 15th Jan.	Delivered at term (? days—child evidently full time). Natural labour—14 hours. Pains normal throughout. No laceration. Loss 6 oz.	General health fair. Scarlatina complicated with nephritis at 28. Anasarca last 3 months of each pregnancy since that time. Pale, pasty, "renal" look, aching across loins, with some anasarca on admission	iii (15th Jan.): Disturbed sleep, slight malaise	iv (16th Jan.): Scarlatiniform and well developed under fomentation on abdomen; papular, patchy, blotchy, and itching on lower extremities. During two following days it invaded whole body, but was somewhat migratory and patchy, and, though mainly scarlatiniform, in parts appeared as itching blotches. On vii and viii it had disappeared, except from pit of stomach and round waist	Tongue norm throughout. No sor throat. On ix to glands on left side neck enlarged a became painful wit out assignable cau Three days later the were smaller and le painful

* *I. e.* 280 days from termination of perio

Cases of Scarlatina.

counted from midnight to midnight. If a patient be delivered at 10 p.m. (being commences at midnight. If, however, delivery occur before 10 p.m. the reckoned to commence at midnight.

Temperature, &c.	Complications.	Course of puerperium.	Desquamation.	Date of discharge from General Lying-in Hospital, and subsequent history.	Child.
Slight rise on ii and iii On evening of v (30th Dec.) rose with chill, and reached 102°. Persisted for one day, intermitted during next four days, and declined to normal on xi. Pulse-rate at onset suddenly increased from 72 to 112. General condition throughout was but little affected	None	Slight after-pains on ii. Little tenderness over fundus ii, iii, iv. Vaginal examination on xi—nothing abnormal. Fundus steadily declined. Lochia, after having been scanty for 3 days, again became free on the appearance of the scarlatiniform eruption, and ceased on xii. Milk came in on iii; supply unaffected	Noted on xiii that skin was "perhaps a little harsh," but no desquamation was observed till 3 weeks after she left hospital (4th Feb.), when, suspicion being aroused, she was examined, and traces were found on feet and ankles (scaly)	xv (9th Jan.): Returned with child to house whence she came. Continued in good health	Unaffected and healthy. Suckled throughout.
[illegible] nearly 1° on iii, and continued 1° above normal throughout. Pulse was steady throughout. Patient complained of slight malaise from iii onward	Albuminuria throughout (evidently the result of nephritis previous to admission)	Considerable after-pains on ii and iii. Slight tenderness over fundus ii—viii (slight cystitis). Vaginal examination on xi—nothing abnormal. Fundus remained a little high for some days. Lochia, having been scanty for 2 days previously, again became free on v, as the rash became general, and ceased on x. Milk came in on iii—fair supply at first, much diminished on vii	None when she left hospital on xiv. General desquamation, however, followed, and traces were apparent (21st Feb.) a month after she left hospital (flakes)	xiv (26th Jan.): Returned with child to her own home. Continued in fair health	Unaffected and healthy. Suckled throughout, but condensed milk also given from vii onwards.

[illegible]d 294 days from its commencement.

No. of Case.	Date of admission.	Labour.	General condition and previous illness.	Initial symptoms.	Eruption.	Tongue, throat, and cervical glands.
III (Hosp. Rep., 15)	A. S., single, æt. 22. 1-para. Abort. 0. Admitted 14th Jan., 1884, 9.0 p.m. Delivered 15th Jan., 12.15 a.m. Failed 17th Jan.	Delivered at term (305+4 days—reputed from coitus about April 10th=280 days). Natural labour—10 hours. Pains normal throughout, but patient rolled about much and was difficult to manage. Fourchette torn. Loss 4 oz.	General health excellent. No previous scarlatina. Was suffering from leucorrhœa and (?) recently-acquired syphilis on admission	ii (16th Jan.): Slight chill, restlessness, tongue slightly furred and streaked, face flushed. iii: Slight rigor, severe frontal and vertical headache, nausea. iv: Chills, insomnia, restlessness, twitching of face, dry tongue, face much flushed	iv (18th Jan.): Itching and scarlatiniform from head to foot, well developed on trunk. On following day still more pronounced, but absent from space, size of palm of hand, in umbilical region. Many sudamina. On vi more distinct and a little patchy, like measles. Next day fading on chest and back; elsewhere disappeared. On viii original rash gone, but during night urticarious rash appeared on upper arms, forearms, hands, and legs below knee, extending to dorsum of foot. On the following day this rash was more developed, and had extended to thighs, but suddenly disappeared during following night	Tongue slightly furred and streaked on ii; subsequently became thickly coated, dry in centre and tip on iv; disposed to clean on vii, and on ix and following days fur was separating, but on xii and xiii again became coated and streaked, cleaning rapidly on xiv. No sore-throat Glands not affected
IV (Hosp. Rep. 21)	A. W., single, æt. 19. 1-para. Abort. 0. Admitted 29th Jan., 1884, 4.35 a.m. Delivered 29th Jan., 9.35 a.m. Failed 1st Feb.	Delivered at term (276+8 days—reputed from coitus, May 4th =270 days). Natural labour—12 hours. Pains normal throughout. Fourchette and both labia torn. Loss 6 oz. Portion of chorion 4×4 in. retained	General health excellent. Measles and scarlatina when quite young	iv (1st Feb.): Frontal headache, flushed face	iv (1st Feb.): Scarlatiniform over trunk, faint on chest, very distinct on abdomen under fomentation. Next day less pronounced, but extended to buttocks and upper and inner part of thighs; a few papules on forearm and blotchy rash on elbows. On vi fading, and almost disappeared by viii. On x irregular patches of blotchy roseola were found between shoulder-blades and on front of chest, but no eruption elsewhere	Papillæ of tongue more prominent than usual on vii and viii. No subjective soreness, but on v throat a little congested, with few enlarged follicles on ix; more congested and deep red spot, size of lentil, on left tonsil on x. Congestion less, but pillars of fauces and right tonsil congested on xi; disappeared xiii. Glands shotty xi—xiv

Temperature, &c.	Complications.	Course of puerperium.	Desquamation.	Date of discharge from General Lying-in Hospital, and subsequent history.	Child.
Rose 1° with slight chill on ii, and with rigor on night of iii to 104°; persisted with considerable remissions, followed by chills, for 3 days, and fell to 1° above normal on viii. This point it maintained till xii, when it rose with another rigor to 104°, persisted, with slight remissions, till xxiv, and then ended in marked crisis. After having been normal for 3 days, it rose 1°, which was maintained till she left hospital. Pulse-rate at onset suddenly increased from 80 to 100, and respirations from 20 to 28 at onset of pleurisy. General condition at first in proportion to pyrexia, serious xii—xvii, improved slowly till xxiv, and then rapidly	Localised dry pleurisy set in on vi in region of pulmonary cartilage, and rapidly spread over area size of palm of hand, persisting till xxii. Signs of congestion at base of right lung on xv. Nephritis set in on xiii (albuminuria, varying in amount from ¼ to mere trace, continued till xxiii)	Slight after-pains on ii. Slight tenderness in left iliac region on ii and iii, and signs of slight pelvic peritonitis iii—ix. Abdomen became generally tender and resistant on xii, and, on vaginal examination, a round, tender, fixed mass found occupying right posterior quarter of pelvis in situation of right ovary. Tenderness and distension diminished xvii, and on xxv there remained slight tenderness in left iliac fossa on deep pressure only, and this soon disappeared. Laceration took on unhealthy character on iv, but soon healed. Fundus almost in brim on iii. Lochia free first 3 days, scanty iv, again free on following day, and ceased on x. Milk came in on ii, diminished viii, permanently ceased xv	x: Skin of arms and legs dry and scurfy. xi: Commenced in sudamina round waist. xviii: Whole surface very scaly, and palms and soles peeling. On xxiv epidermis separating in large flakes. So free was desquamation, large flakes being shed from limbs and trunk, that she was kept in Stockwell Hospital till 11 weeks after delivery	xxxiii (16th Feb.): Transferred to Stockwell Hospital with child. Ultimately made good recovery, and left there 29th March	Unaffected, but probably syphilitic. Breast milk only till viii Partly fed with condensed milk till xv, when it was weaned.
Rose on iii and iv, and reached 101·4°. Continued, with intermissions, to reach 100° for 4 succeeding days. On ix and x (secondary throat affection) rose to 101°, then declined to normal. No further rise occurred. Pulse-rate at onset suddenly increased from 72 to 84. General condition throughout was but little affected	Slight albuminuria on xii	No after-pains. Very slight tenderness in left iliac region on ii. Both labia œdematous on iii; next morning missing portion of chorion found at vulva and removed. Vaginal examination on xvi—nothing abnormal. Fundus remained rather high for some days, but in pelvis on x. Laceration healed x. Lochia, having been scanty on iii and iv, again free for 2 days after appearance of rash, and ceased on xiii. Milk established iii, much diminished on viii before belladonna was applied	Powdery desquamation at angle of jaw, and skin of arms rough on x. Distinct desquamation just below left nipple and whole surface rough xvi. Feet desquamating xviii	xix (16th Feb.): Transferred to Stockwell Hospital, which she left after satisfactory convalescence, 15th March	Probably scarlatina. Died on vii having had fits continuously for 24 hours, and diarrhœa and sickness for 2 days. Breast milk only.

No. of Case.	Date of admission.	Labour.	General condition and previous illness.	Initial symptoms.	Eruption.	Tongue, throat, cervical glands.
V (Hosp. Rep., 25)	A. H., single, æt. 22. 1-para. Abort. 0. Admitted 31st Jan., 1884, 1.30 a.m. Delivered 31st Jan., 6.10 a.m. Failed 4th Feb.	Delivered at term (300+4 days—reputed from coitus about April 30th=286 days). Natural labour—13 hours. Pains normal till child was born, but patient rolled about much and was difficult to manage. Vagina torn on either side. 3 deep wire sutures. Inertia in 3rd stage. Loss 21 oz. Peculiar unpleasant odour (not of ordinary decomposition) noticed during labour	General health excellent. Measles and scarlatina when quite young. Bronchitis last winter. Suffering from recently-acquired syphilis and leucorrhœa on admission	v (4th Feb.): Sleeplessness, restlessness, mental depression, frontal headache, furred tongue, flushed face, and suffused conjunctivæ	vii (6th Feb.) Scarlatiniform, and well developed from head to knees. It never spread to arms nor below knees. Began to fade on ix, and on following day entirely gone, leaving slight pigmentation in both flanks	Tongue slightly coat v—ix, otherwise n mal. No subject soreness on vii, pharynx red and gested; few red s on soft palate. following day pe nent follicles on palate, slight s ness, which incre ed; on ix fau were swollen congested; spots spread to uvula back of pharyn On xi throat felt and was coated w thick secretion; t terior pillar of fau on left side conge ed. Cervical gla shotty and enlarg vii—xi. Pain at ang of jaw on openi mouth ix
VI (Hosp. Rep., 26)	E. J., single, æt. 29. 1-para. Abort. 0. Admitted 31st Jan., 1884, 1.30 a.m. Delivered 31st Jan., 7.5 a.m. Failed 5th Feb.	Delivered at term (276 + 2 days—reputed from coitus on April 23rd=283 days). Natural labour—26½ hours. Pains normal till child was born. Perineal body considerably torn. 3 deep wire sutures. Inertia in 3rd stage. Loss 24 oz. Peculiar unpleasant odour (not of ordinary decomposition) noticed during labour	General health good. Nervous temperament. Measles and scarlatina when very young. Suffering from leucorrhœa on admission	None	vi (5th Feb): Scarlatiniform with sudamina under fomentation on abdomen. Became general on following day, less distinct on abdomen, but well marked in flanks and on back; little patchy on chest, and blotchy over knees and elbows. On viii and ix more pronounced, a deep red blush from head to foot. Rapidly faded, and on xii had entirely gone, leaving distinct pigmentation, especially on forearms	Tongue slightly coate distinct papillæ vii, more coated began to clean No subjective sore ness, but on vii uvul pillars of fauces, a pharynx congeste few spots on uvul Very characteristi on ix with spots a enlarged follicles soft palate, and sho ty cervical gland Less congested, b dry and coated wi thick secretion, a glands, especially left side, more e larged on x

Temperature, &c.	Complications.	Course of puerperium.	Desquamation.	Date of discharge from General Lying-in Hospital, and subsequent history.	Child.
ose suddenly to 103·4° n v, and after persisting with considerable remissions declined suddenly with profuse perspiration nearly to normal on morning of ix. Became quite normal 2 days after. On xiv suddenly rose with onset of rheumatism and albuminuria, but next day fell with profuse perspiration, and became normal under the influence of Sod. Salicyl. Pulse steady throughout. Restlessness continued with much headache and retching for 2 or 3 days after onset of scarlatina	Complained on xiv of "dreadful pain like rheumatics in elbows." Next day knees slightly affected. On xiv also complained of aching pain across loins, and slight albuminuria set in. Both had disappeared 2 days later	No after-pains. No abdominal tenderness. Vaginal examination on xiv—nothing abnormal. Fundus in pelvis on vii. Lacerations healed rapidly. Lochia having been scanty came on freely at onset of scarlatina, continued so for 5 days, ceased on xi. Milk came in on iii. Supply unaffected, but was arrested by artificial means on vi	Commenced on forehead on xiv, spread to shoulder on xv, and became general on xvi (scaly)	xvii (16th Feb.): Transferred to Stockwell Hospital with child, where recovery was uninterrupted, and she left 22nd March	Unaffected, but had slight ophthalmia, and showed marked signs of congenital syphilis. Suckled till vi, when condensed milk was substituted.
Very irregular. Began gradually to rise immediately after labour, and reached 101·2° on v (probably due to distended state of bowels, breasts, and bladder). Declined to normal with perspiration and appearance of sudamina on morning of vi. Scarlatinal temperature commenced same afternoon with sudden rise, followed by slight remission and further exacerbation, reaching 105° on xi, and ending by sudden crisis on following morning. Pulse-rate at onset suddenly rose from 76 to 88. General condition in proportion to fever. A subsequent temporary rise of temperature to 102·6° on xvi was probably due to excitement	Decided trace of albumin appeared with general eruption on vii, diminished on xiv, but was still present on xvi. Slight albuminuria continued for some days after she went to Stockwell	No after-pains. Very slight tenderness in left iliac region on iii. Vaginal examination on xiv—nothing abnormal. Fundus remained rather high for 11 days. Laceration healed. Lochia having been scanty for 6 and yellow for 3 days became free and pink as eruption became general, but ceased on xi. Peculiar odour became more marked just before onset of scarlatina. Milk plentiful at first, diminished on viii, and ceased on xi	xiv: Scaly on forehead. On xvi whole surface harsh, face and feet peeling	xvii (16th Feb.): Transferred to Stockwell Hospital with child. On 21st and 22nd rose to 103·8° and 102·2° respectively (probably from constipation). Subsequently normal. Made good recovery, and left 15th Mar.	Unaffected and healthy. Breast milk only till viii, partly fed with condensed milk till xi, and then weaned.

No. of Case.	Date of admission.	Labour.	General conditions and previous illness.	Initial symptoms.	Eruption.	Tongue, throat, cervical glands.
VII (Hosp. Rep., 35)	B. F., single, æt. 25. 1-para. Abort. 0. Admitted 7th Feb., 1884, 12.45 a.m. Delivered 8th Feb., 1.30 a.m. Failed 30th Jan.	Delivered at about 8 months (? days, but child apparently about 8 months' gestation). Labour 40½ hours. Premature rupture of membranes. Pains irregular. Cervix very rigid. Transverse presentation. Internal turning under chloroform. Vagina very narrow. Perinæum deeply lacerated. 2 deep wire sutures and 1 superficial. Inertia throughout. Loss 22 oz. Child died during delivery	General health good. No previous scarlatina. Suffering from leucorrhœa on admission, and looking pale, pasty, and ill; sordes on lips; red, irritable, over-clean tongue; offensive breath; throat dry and coated with brown secretion. Eruption. Very thirsty Temp. 99°	Nine days before admission (29th Jan.) was quite well and went to a pantomime. Next day felt cold, shivered all day, severe frontal headache, anorexia, nausea, aching in limbs, stiffness of neck	Seven days before admission (31st Jan.) trunk covered with eruption, extending to knees, soon spread to arms. "Had a colour, and was very red all over; thought I had measles." Rash lasted 3 or 4 days. On admission (7th Feb.) faint papular eruption on trunk and red blush, well marked at lower part of trunk, buttocks, and upper part of thighs, but faint on upper part of trunk and on legs below knee. Next day it was much faded, and 3 days later had disappeared, leaving faint stain on arms, back, and flanks	Says tongue was furred at outset. admission it was irritable, and clean. Next slightly furred. she had pain at of jaw at outset, slight soreness throat did not on till following On admission the dry and coated brown secretion. following day rynx swollen pillars of fauces gested. Glands same time bec distinctly enlar and painful, and tinued so till infl mation of throat sided 3 days after
VIII (Hosp. Rep., 54)	M. A. O., single, æt. 23. 1-para. Abort. 0. Admitted 13th Mar., 1884, 7.45 p.m. Delivered 14th Mar., 12.10 a.m. Failed 12th Mar.	Delivered at ? term (? days, but child apparently full time). Labour 21½ hours. Pains irregular, feeble, and of short duration. Patient rolled about much, and was difficult to manage. Low forceps for premature detachment of placenta. Laceration of right labium extending a little to right of perinæal body. Loss 12 oz.	Measles, scarlatina, and smallpox when young. Subject to colds and enlargement of cervical glands. Left apex phthisical (not active). Scrofulosis. Recently-acquired syphilis. On admission was slightly delirious, faint eruption on back, shotty cervical glands	Day before admission (12th Mar.) slight sore-throat, nausea, malaise, anorexia; lassitude and pains in limbs for some days previously. On morning of admission teeth chattered, severe frontal headache, followed by delirium, sleeplessness, flushed face, and suffused conjunctivæ. Hands and feet slightly swollen	On admission (13th Mar.) faint scarlatiniform on back and abdomen. Next morning scarlatiniform rash over trunk, most marked under binder. It spread below knees during day. It disappeared 2 or 3 days later	(14th Mar.): Tong slightly furred, larged papillæ at t Slight sore-thr day before admissio Cervical glands sh ty on admissio Morning after d very throat felt v sore, and presen well-marked scarl tinal inflammatio It continued sore f a week

Temperature, &c.	Complications.	Course of puerperium.	Desquamation.	Date of discharge from General Lying in Hospital, and subsequent history.	Child.
Very feverish and thirsty, and felt too ill to get up for 2 or 3 days at outset. Temp. normal on admission, but patient looked very pale and ill. Temp. rose to 100·4° on iii (probably result of a purge), subsequently normal till after she left hospital. On morning of xxxiii (10th Mar.), however, sudden rise at onset of acute nephritis, and during following week occasionally reached 100°—101°, after that remained normal. Pulse steady throughout	Slight secondary throat on admission. Five weeks after delivery albuminuria, dropsy, uræmic vomiting, and convulsions	No after-pains. Slight tenderness over bladder on iii. Retention of urine and distended breasts for a few days. Perinæum and vagina œdematous for 10 days, but lacerations healed. Vaginal examination on ix—nothing abnormal beyond some soreness from state of perinæum. Lochia free for 6 days, ceased viii. Belladonna applied to breasts after labour; became hard and painful on iii	vi: Free scaly desquamation on face. On following day round finger-nails. Two days later flakes separating	x (16th Feb.): Transferred to Stockwell Hospital. Desquamation continued freely. Slight albuminuria 17th—20th. xxiii (10th March): Pyrexia, nausea, œdema of face, urine albuminous and bloody. Convulsions set in same evening, and continued till 4 p.m. next day. Albuminuria continued for a week. Discharged well 25th April	Died during labour.
No rise recorded while in hospital. Had slight rigor before admission, and perspired much on following night. Pulse 88 during and after labour. Was feverish for a fortnight, and kept bed for a month after she went to Stockwell	None recorded, and no account can be obtained of any	No after-pains. Very little tenderness in lower abdomen for 2 or 3 days after she went to Stockwell. Lochia moderate in quantity, ceased about 3 days after she went to Stockwell. Milk came in on iii; breasts became very full; belladonna applied on i	Free powdery desquamation occurred. It began 8 or 9 days after she went to Stockwell on trunk and arms	Transferred to Stockwell Hospital with child 24 hours after delivery. Discharged well 3rd May	Probably had scarlatina. Was very red all over 24 hours after delivery, wasted; had very sore mouth and convulsions for 24 hours, and died on viii. Not put to breast after first day.

No. of Case.	Date of admission.	Labour.	General condition and previous illness.	Initial symptoms.	Eruption.	Tongue, throat, and cervical glands.
IX (Hosp. Rep., 85)	Mrs. K., married, æt. 28. 3-para. Abort. 0. Admitted 20th April, 1884, 8.45 p.m. Delivered 21st April, 12.25 a.m. Failed 23rd April	Delivered at term (280+4 days). Natural labour—16 hours. Pains normal throughout. Mere abrasion in situation of fourchette. Loss 4 oz.	General health excellent. Measles, whooping-cough, and possibly also scarlatina when young	iii (23rd April): Sleeplessness, severe frontal headache, anorexia, flushed face, chills	iv (24th April): Morbilliform and well marked on abdomen under fomentation, and fairly so on back, buttocks, shoulders, and upper and inner part of thighs; faint on chest and forearms. v: Well developed and scarlatiniform, general, except below knees. Disappeared by ix	Tongue slightly coate on 1st day of eruption On following da over-clean and fe enlarged papilla. N further note. No sub jective soreness, bu on 2nd day of erup tion spots on soft pa late, and throat gene rally congested, espe cially left anterio pillar of fauces. Shot ty cervical glands o same side. A fort night after she wen to Stockwell ha slight sore-throat an lumps in neck
X (Hosp. Rep., 91)	Mrs. U., married, æt. 31. 3-para. Abort. 1 at 3–4 mos. Admitted 25th April, 1884, 9.55 a.m. Delivered 25th April, 1.0 p.m. Failed 28th April	Delivered at term (280+7 days). Premature rupture of membranes, otherwise normal labour—6 hours. Pains feeble. No laceration. Loss 5 oz.	General health excellent. Scarlatina at 10, measles at 12 years of age	v (29th April): Chilly, slight frontal and occipital headache	v (29th April): Scarlatiniform on abdomen where fomentation has been applied. On following day eruption well developed, and extended over trunk, arms, and upper part of thighs. Fading on vii, sudamina at root of neck	Tongue glazed an over-clean on vi an following day. Cer vical glands shotty o vi and vii, and nex day felt swollen. N further note. No sub jective sore-throat Anterior pillars o fauces on left sid slightly congested On vi and on follow ing day throat felt dry at same time conges tion more marked and some exudatio on right tonsil
XI (Hosp. Rep., 93)	A. B., single, æt. 17. 1-para. Abort. 0. Admitted 26th April, 1884, 4.0 a.m. Delivered 26th April, 7.10 p.m. Failed 29th April	Delivered at 8½ months (about 266 days—reputed from coitus about Aug. 10th =260 days). Premature labour—22 hours. Pains normal. Slight abrasion of posterior vaginal wall. Loss 4 oz.	Slight build. Anæmic. Measles and ophthalmia when quite young. No previous scarlatina. Suffering from leucorrhœa on admission. An abscess in right labium had been opened on previous day	iii (29th April): Nausea, slight frontal headache. iv: Sleeplessness, furred tongue, flushed face	iv (30th April): Faint red blush on chest, buttocks, and arms. On v scarlatiniform, but not very pronounced, nor did it become so. Disappeared a day or two later	Tongue slightly coate and presented en larged papillæ at out set. On iv both pillar of fauces decidedly congested, and gland behind sterno-mas toids enlarged. O following day conges tion more intense and a patch of exuda tion, size of lentil, o left tonsil. Throa felt a little sore fo 3 or 4 days after sh went to Stockwell

Temperature, &c.	Complications.	Course of puerperium.	Desquamation.	Date of discharge from General Lying-in Hospital, and subsequent history.	Child.
Reached 100·2° on iii, but declined to normal, and rose again with chill to 100·6° on following day. Next day again fell to normal. Was a little feverish for a week after she went to Stockwell. Pulse-rate at onset suddenly increased from 60 to 80	None recorded, and no account can be obtained of any, except slight secondary throat affection	Considerable after-pains on ii. Fundus a little tender i—iv. Vaginal examination on v—nothing abnormal discovered. Fundus remained rather high at first, and on ii patient passed a small clot. Lochia became more free at onset of scarlatinal symptoms, and subsequently took on peculiar unpleasant odour. They remained free for some days, and ceased 9 weeks after delivery. Milk came in on ii. Supply plentiful till vii, when it diminished, and did not increase again till after she left Stockwell	Powdery during first fortnight at Stockwell, chiefly on legs, arms, and chest	v (25th April): Transferred to Stockwell Hospital with child. She kept bed 3 weeks and suffered from severe constipation, but made good recovery, and left 1st June	Unaffected. Had slight attack of jaundice with green stools when transferred to Stockwell. Suckled till 8 months old.
None recorded above normal, even after the chill. She states that she kept her bed till xxx, mainly, however, on account of her child, and that she was never very feverish. Pulse-rate at onset suddenly increased from 64 to 80	None recorded, and no account can be obtained of any	Considerable after-pains on ii. Slight cystitis and unable to relieve bladder naturally till vii, accompanied by slight general tenderness of abdomen and flatulent distension. Lochia normal; ceased vii. Vaginal examination on vii—nothing abnormal found. Right breast distended on iv; supply almost arrested from vi—xviii, when milk suddenly reappeared, and for 16 months from that time continued so freely that child for a whole year had nothing else, and even then she experienced great difficulty in getting rid of it	Powdery while at Stockwell, before child was affected with scarlatina	vii (1st May): Transferred to Stockwell Hospital with child. She made good recovery. Was detained an extra week on account of child. Returned home with infant on 15th June; one of her children went to Oxford on 17th, and failed with scarlatina on 20th, and the other, who remained at home, failed on 21st. Both recovered	Failed with scarlatina about xxi, scarlatiniform eruption and sore mouth followed by desquamation (very large flakes).
Rose suddenly on iii to 103°, and declined with diaphoresis to normal on morning of v, but rose again with chills later in same day. Was very feverish for a week after she went to Stockwell, and slightly so during the following week. She kept her bed there for 3 weeks. Pulse was steady throughout	None recorded, and no account can be obtained of any	No after-pains. No abdominal tenderness. Vaginal examination on v—nothing abnormal found. Fundus declined naturally. Lochia became rather more free at onset of scarlatina, and ceased about xiv. Milk came in on ii. Supply not affected during stay in hospital, nor while at Stockwell. Child was weaned a week after she left Stockwell	General, in flakes up to size of thumb-nail, while at Stockwell	v (1st May): Transferred to Stockwell Hospital with child. Made excellent recovery and left 21st June	Unaffected. Breast milk only till 2 months old.

No. of Case.	Date of admission.	Labour.	General condition and previous illness.	Initial symptoms.	Eruption.	Tongue, throat, and cervical glands.
XII (Hosp. Rep., 93)	Mrs. P., married, æt. 18. 1-para. Abort. 0. Admitted 27th April, 1884, 2.15 p.m. Delivered 27th April, 4.10 p.m. Failed 29th April	Delivered at term (about 278 +3 days). Natural labour—13½ hours. Pains normal. Slight tear of perinæum. Loss 6 oz.	General health good Measles at 6 years of age. No previous scarlatina. Suffering from leucorrhœa on admission	iii (29th April): Flushed face	iv (30th April): Well-developed scarlatiniform rash, general, except feet and ankles. Few sudamina about shoulders. On vi faded, except on buttocks and back. Few sudamina at pit of stomach	Tongue normal. No subjective soreness, but on iv pillars of fauces slightly congested, and on following day, together with tonsils, were swollen and congested; spots apparent on uvula. At same time cervical glands became slightly shotty
XIII (Hosp. Rep., 121)	Mrs. W., married, æt. 27. 1-para. Abort. 0. Admitted 10th June, 1884, 4.15 p.m. Delivered 10th June, 9.30 p.m. Failed 10th June	Delivered probably at term (? days, child apparently full time). Labour—12 hours. Pains feeble throughout. Portion of decidua retained in lower segment of uterus. Perinæal body slightly lacerated, and skin over it torn to verge of anus. Small laceration at root of clitoris oozed considerably. Inertia in 3rd stage. Loss 31 oz. Peculiar unpleasant odour noticed during labour	General health excellent. Measles in childhood. No previous scarlatina	On admission was semi-delirious and complained of chilliness. ii (11th June): Slept but little, frontal headache. iii: Face much flushed	iii (12th June): Scarlatiniform general, well developed, most marked on arms, chest, and back	iii: Tongue clean, flabby, and pale. No subjective soreness, but on iii throat slightly congested, and few enlarged follicles at back of pharynx. At same time glands along sterno-mastoids became shotty, especially those low down on right side of neck. No further note
XIV (Hosp. Rep., 284)	Mrs. McI., married, æt. 26. 3-para. Abort. 0. Admitted 12th Nov., 1884, 12.20 a.m. Delivered 12th Nov., 1.30 a.m. Failed 13th Nov.	Delivered at or near term (about 271+4 days). Natural labour—11¼ hours. Pains normal throughout. No laceration. Loss 2 oz.	Measles in childhood. No previous scarlatina. On admission pleuritic effusion on right side, symptoms dating from cold caught about month before, and followed by daily chills and feverishness. Suffering from recently-acquired syphilis	Face much flushed 8 hours after labour. ii (13th Nov.): Cough worse. Resp. 36. Tongue inclined to dryness. iii: Chest signs unaltered. Tongue coated with thick yellow fur. iv: Face much flushed; slight suffusion of conjunctivæ	iv (15th Nov.): Scarlatiniform general, well developed. Inclined to be blotchy on knees and elbows	Tongue inclined to dryness on i and ii; coated with yellow fur on iii and iv. No enlarged papillæ. Throat very slightly congested on iv, but no soreness felt. At same time glands behind sterno-mastoids shotty

Temperature, &c.	Complications.	Course of puerperium.	Desquamation.	Date of discharge from General Lying-in Hospital, and subsequent history.	Child.
Rose a few hours before appearance of eruption on evening of iii to 101°, but declined to normal, with perspiration, on following morning, rising again on following evening to 102°—103°, with much restlessness, nervous depression, and severe headache, followed by slight delirium. No further note. Pulse-rate at onset suddenly increased from 64 to 76	v: Slight albuminuria. Patient could not be traced after leaving Stockwell	No after-pains. No abdominal tenderness. Vaginal examination on v—nothing abnormal found. Laceration healed rapidly. Fundus declined naturally. Lochia free at first for four days, then became scanty. Milk came in on iii; supply continued till she left hospital, but failed entirely 2 days later	Occurred while at Stockwell	v (1st May): Transferred to Stockwell Hospital with child, at height of fever. Made uninterrupted recovery and left 16th June	Unaffected. Slight ophthalmia and slight jaundice. Suckled till vii.
Two hours after labour was 100·8°, and next morning 101°. It declined 1°, and remained at 100° till she was transferred. During following week it varied from 100° to 101·6°, and then became normal. Pulse 104° two hours after labour, and 112 on ii	None noted. Patient could not be traced after leaving Stockwell	No after-pains. No abdominal tenderness. Lochia continued freely for some days, and peculiar offensive character, noted during labour, increased. On iii a small offensive clot was removed and iodoform bougie inserted into uterus. Subsequently douches of Condy employed. On 15th June lochia still free, but not offensive. One suture removed on same day, and remaining one 3 days later, but parts failed to unite. Lochia then scanty. Colostrum in breasts when transferred. No further note	11th July: "Desquamating"	iii (12th June): Transferred with child to Stockwell Hospital. Made uninterrupted recovery, and was discharged 2nd Aug.	Unaffected. No note as regards suckling.
Reached 104° on i, and 101°—103° during remainder of stay in hospital. Pulse 110 on i and ii, 96 on iii and iv. Was delirious, and ate nothing for days after she was transferred to Stockwell. Was very weak. Left her bed for the first time about a week before her discharge, and had to be taken home in an ambulance carriage	Pleurisy with effusion. The fluid disappeared during her stay at Stockwell	No after-pains. No abdominal tenderness. Fundus declined naturally. Lochia free on i and ii, and on iii and iv scanty. Milk came in on iii, fair supply on iv, but ceased entirely after she was transferred to Stockwell	Desquamated while at Stockwell	iv (15th Nov.): Transferred with child to Stockwell Hospital. Was discharged 10th Jan., 1885, in a weak state of health. This patient died about a year afterwards, following operation for double ovarian tumour; one cyst was very adherent	Unaffected. Suckled for few days, subsequently hand fed, very fretful.

No. of Case.	Date of admission.	Labour.	General condition and previous illness.	Initial symptoms.	Eruption.	Tongue, throat, and cervical glands.
XV (Hosp. Rep., 291)	Mrs. H., married, æt. 30. 7-para. Abort. 0. Admitted 23rd Nov., 1884, 11.30 p.m. Delivered 24th Nov., 5.10 p.m. Failed 7th Dec.	Delivered at term (303+3 days). Natural labour—13¼ hours. Pains normal throughout. No laceration. Loss 4 oz.	General health good. Measles and scarlatina in childhood. Also severe attack of scarlatina 10 days after fourth child was born. Husband and children laid up with it at same time	xiv (7th Dec.): Chilliness of feet, nausea, giddiness, flushed face, coated tongue with enlarged and red papillæ at tip	v: Faint papular eruption under fomentation on abdomen. Itched. Dying off next day. xiv (7th Dec.): Bright, uniform, red blush from head to foot, little blotchy on elbows and knees. On following day a little faded, papules elevated and well marked, especially on back and buttocks. The rash lasted 4 or 5 days	At onset tongue coated with enlarged and red papillæ at tip. No subjective soreness, but several spots on uvula and soft palate, and pillars of fauces slightly congested. Pharynx congested on following day. Glands behind sterno-mastoid on left side little shotty on xiv and xv
XVI (Hosp. Rep., 292)	Mrs. D., married, æt. 25. 2-para. Abort. 0. Admitted 24th Nov., 1884, 9.30 a.m. Delivered 24th Nov., 1 p.m. Failed 17th Nov.	Delivered at 8 months (243+4 days). Premature labour—12½ hours. Partially macerated fœtus, dead probably 1 week. Excess of liquor amnii. Pains feeble throughout, and inertia set in early. No laceration. Loss 14 oz.	Scarlatina at 3 years of age. Probably syphilitic	Vomiting, sleeplessness, malaise week before admission	None noticed either before admission or during puerperium. On admission, however, some bronzing (thought at the time to be due to syphilitic roseola) was noticed in loins. Temp. 99 8°	Tongue clean throughout, and no sore-throat while in hospital. Had felt no soreness previously

Temperature, &c.	Complications.	Course of puerperium.	Desquamation.	Date of discharge from General Lying-in Hospital, and subsequent history.	Child.
With exception of rise to 100·2° from state of bowels on iii had been normal throughout puerperium. It rose with chilliness of feet to 99·8° at onset of scarlatina. Pulse-rate at onset suddenly increased from 68 to 76	Went out of doors and caught cold about 3 weeks after she was transferred to Stockwell. She shivered and was feverish, had headache, and swelling of the feet. Kept her bed about a week No note made of albuminuria	Was convalescent when attacked. Fundus was then in pelvis and did not become tender. Lochia, after having become brown and then yellow, resumed a red colour day before patient failed, and after 2 days became yellow again. Milk supply unaffected throughout	Desquamated (scaly), but not very freely except on hands, feet, legs, and between shoulder-blades, while at Stockwell	xv (8th Dec.): Transferred with child to Stockwell Hospital. She was discharged 24th Jan., 1885	Three weeks after going to Stockwell had general scarlatiniform rash, and was very fretful for some days, but no distinct desquamation followed. Illness diagnosed scarlatina. Was kept at breast
Temp. 99·8° on admission, and during and after labour, but became normal on ii. It rose with slight rigor to 101° on iii during administration of enema. Breasts were much distended, and much difficulty was experienced in relieving bowels. Enema acted freely, and temp. fell immediately to normal, and there remained during rest of puerperium. Pulse 108 during 1st stage of labour, 104 two hours after labour and on i; subsequently 60 to 76	None noted. Urine on iii not albuminous, but reduced an equal volume of Fehling	Slight after-pains i—iii Very little abdominal tenderness i—iii. Fundus rather high first week. Vaginal examination on xiii—uterus not well involuted. Lochia continued till xiv. Glycerine of belladonna applied to breasts on ii. Much distension of mammæ on iii, subsided during next 3 days	As patient was dressing to leave hospital on xiv she remarked to nurse, "Oh! look at my arms, how rough they are,—they are quite peeling." Desquamation confirmed by subsequent visit, and also found at angle of jaw (scaly)	xiv (8th Dec.): Returned to her own house before nature of case was suspected, and continued in good health	Stillborn, macerated, peculiar smell like fresh-gathered mushrooms. Epidermis separating in patches

I. *The Liability of Pregnant and Parturient Women to Scarlatinal Infection, and the Duration of the Incubation Period.*

(Received 1st July, 1887.)

(*Abstract.*)

THE author refers to the rare occurrence of scarlatina during pregnancy, and its almost invariable appearance during the first few days of the puerperium. Bearing in mind the alteration in the existing conditions which take place at delivery, he insists that the two classes of cases must be kept separate, and that a distinction must be drawn—

(*a*) Between those cases *which receive infection* prior to delivery, and those which receive infection during or after labour.

(*b*) Between those cases *which fail* before delivery, and those in which the disease does not make its appearance till after the onset of labour.

He further points out that the duration of pregnancy has an important bearing on the question of incubation.

The sixteen cases of scarlatina are arranged in groups according to the time at which exposure occurred (see Table A). The following inferences are drawn:

1. As regards the time, with reference to labour, at which the disease shows itself—

(*a*) That scarlatina almost invariably occurs within the first week of the puerperium, and its occurrence at a later period is extremely rare; and—

(*b*) That in exceptional instances scarlatina may show itself during pregnancy, shortly before the onset of labour.

2. As regards the liability of pregnant and parturient women to scarlatinal infection, and the reciprocal influence existing between the latter and parturition—

(*a*) That a woman exposed to the disease may become infected with scarlatina during pregnancy, during or after labour.

(*b*) That the liability to infection is especially marked shortly before, and during the first few days after, delivery, but does not extend far into the puerperium.

(*c*) That, if infection occur during pregnancy, the onset of labour may be thereby precipitated.

(*d*) That, when infection takes place during or shortly after labour, the incubation period may be shortened; and, finally—

(*e*) That the foregoing considerations are in themselves sufficient to explain the frequent onset of scarlatina during the first week of the puerperium, without the necessity of ascribing to scarlatina in pregnancy an incubation period exceeding that of ordinary scarlatina.

A consideration of the above-mentioned cases shows that it is possible for a woman who has contracted scarlatina during pregnancy to fail with the disease either before, during, or after labour, and for a woman who fails with scarlatina during the puerperium to have contracted the disease either before, during, or after labour. But scarlatina, developed either before or during labour, must necessarily have been contracted during pregnancy, and scarlatina contracted either during or after labour must of necessity show itself during the puerperium. In considering the question of incubation it is necessary to bear these points continually in mind.

The great liability of pregnant and parturient women to contract scarlatina is on all hands admitted. Very few cases, however, of scarlatina *developed during pregnancy* are on record. For instance, of the 141 cases of scarlatina collected by Olshausen, in 7 only did the disease show itself before the commencement of labour. It is somewhat curious, therefore, that in 3 of the 16 cases which came under my own observation the disease should have manifested itself before delivery, and, furthermore, it is remarkable that in each of these cases the nature of the disease was not recognized at the time; indeed, in two of them medical advice was not called in, and in the other the symptoms were attributed by the doctor to

something totally different. And in this connection the question naturally arises whether the pregnant state, as long as it is maintained, may fail to exert an intensifying influence, such as has been attributed to the puerperal condition, and by failing to modify the symptoms, render it probable that the attack should pass unrecognized. Such cases as the three above referred to certainly tend to support that view. The total number of adequately recorded cases available which have a bearing upon this point, is, however, as yet so small that no certain conclusion can be drawn from them.

In almost every instance the disease *declares itself during the first few days of the puerperium.* Thus, in the same series of cases collected by Olshausen, 8 patients were attacked immediately after delivery, 62 others on the first or second day, 27 on the third, and 22 after the third, but not one after the eighth. A case then such as XV, in which the disease made its appearance thirteen days after delivery, is quite exceptional. Moreover, the same patient not only is said to have had scarlatina in childhood, but appears to have had a previous attack ten days after the birth of her fourth child. Another case, reported by E. Donaldson, in which the patient failed on the sixteenth day of the puerperium, is to be found in the 'Collective Investigation Record,' vol. ii, 1884, p. 149.

Putting aside, however, these exceptional instances, the fact remains that scarlatina usually shows itself within the first week of the puerperium.

Very opposite opinions as regards the duration of the incubation period have been entertained with a view to explain this early onset of scarlatina after delivery, for while one set of observers seeks to explain the fact by supposing that infection occurs at or soon after delivery, and that the incubation period is shortened, others seek an explanation of the very same fact on the supposition that infection occurs during pregnancy, but (as in many instances no precise source of infection can be established to their satisfaction within a reasonable period preceding

delivery) they are led to assume that the disease may remain latent till after labour; in other words that the incubation period may be prolonged.

Obviously, the key to the solution of these diametrically opposed views is to be found in any facts with regard to exposure which tend to show whether infection is likely to have occurred, on the one hand, during any period of pregnancy, and, on the other, either during or after labour.

Owing to the fundamental difficulty of determining the exact period at which the poison enters the system, even when the precise source and duration of the exposure is known, the question is at the outset hampered by uncertainties. However, one point is certain,—the incubation period clearly cannot extend farther back than the date at which exposure commenced, but it by no means follows that they are commensurate, for, though infection cannot take place till exposure, it may not occur until long after the exposure commenced. In order to throw what little light I can on this vexed question, I have related with considerable detail the facts referring to exposure, as far as they could be ascertained, in each case. And, in considering this matter, it is necessary at the outset to dissociate cases in which exposure occurred during pregnancy from those which were not brought into contact with scarlatina until after delivery, or at any rate until the onset of labour, for at delivery the existing conditions are profoundly altered.

The following table (A) is intended to show the chronological relation existing between the exposure to scarlatina and delivery. It also indicates the period of pregnancy at which labour set in. The evidence adduced from the last-mentioned data has, as I shall endeavour to show, an important bearing on the question.

These cases naturally fall into four groups (see Table A).

Group I contains two cases in which the period of exposure is not known, but may have been either before or after delivery. One woman was delivered at term, the

A.—*Chronological Relation existing between Onset of Scarlatina and Labour.*

	No. of case.	Time at which exposure occurred.	Onset of scarlatina. In relation to labour.	Onset of scarlatina. After first day of exposure.	Duration of pregnancy dating. From last day of menstruation.	Duration of pregnancy dating. From coitus.
Group I	IX	Not known	58 hours *after* delivery	...	280 days	
	II	„	45 „ „ „	...	Apparently term	?
Group II	VII	During pregnancy	9 *days before* delivery	...	About 8 months	?
	XVI	„ „	About 7 „ „ „	...	243 days	?
	VIII	„ „	2 „ „ „	...	At or near term	?
	XIII	„ „	*During labour*	...	„	?
	XIV	„ „	8 hours *after* delivery (9 hours after admission to hospital)	...	271 days (about)	?
Group III	III	(1). During the 28 days before labour	59 hours *after* delivery	(1). 31 days	305 „	280 days
		(2). „ 5 „		(2). 8 „		
	I	„ 8 „	98 „ „ „	12 „	289 „	273 „
	IV	„ 3 „	74 „ „ „	7 „	276 „	270 „
	V	„ 5 „	97 „ „ „	10 „	300 „	286 „
	VI	„ 5 „	124 „ „ „	11 „	276 „	283 „
Group IV	X	During and after labour	72 „ „ „ (75 hours after admission to hospital and 70 after admission to lying-in ward)	3 „	280 „	?
	XI	„ „ „	60 hours *after* delivery (75 hours after admission to hospital and 58 after admission to lying-in ward)	3 „	266 „ (about)	260 „
	XII	„ „ „	51 hours *after* delivery (53 hours after admission to hospital and 49 after admission to lying-in ward)	3 „	278 „ (about)	?
	XV	„ „ „	13 *days after* delivery (14 days after admission)	14 „	303 „	?

other apparently at the same period, and failed, one 58, the other 45 hours after delivery.

Group II contains five cases in which the patients from the time of onset of the attack may justly be regarded as having been exposed before the commencement of labour, but in which the period of exposure is not known. One failed 9 days, one about 7 days, and one 2 days before delivery, one during labour, and one 8 hours after delivery. In the two first mentioned labour set in about a month before term, and in the remainder may possibly have occurred a few days before the proper time.

Group III contains five cases in which the patients are known to have been exposed before the commencement of labour, one to two sources for the 28 and 5, and the others for the 8, 5, 5, and 3 days immediately preceding labour respectively. Labour set in at term, except possibly in the last mentioned, in which it may have occurred a few days before the full time. These patients failed from 59 to 124 (average 90) hours after delivery.

Group IV contains four cases in which the patients are known to have been exposed during and after labour. Three of these were delivered at term, and one a fortnight before (probably induced by operation on previous day). Three in which the incubation period could not have exceeded 75, 75, and 53, and probably (for reasons previously given) was not more than 70, 58, and 49 hours, failed 72, 60, and 51 hours after labour respectively, but the remaining one (who was distinctly exposed during the puerperium as well) not until 13 days after delivery.

It has been urged that pregnancy, while it renders a woman especially prone to take the infection of scarlatina, exerts such an influence on the poison that as long as the pregnancy persists the development of an attack is rendered extremely difficult. When labour takes place, however, the conditions are at once altered, and this restraining influence, whatever it may be, is then entirely lost, and in its place a state arises which is particularly favourable to the development of the poison, and in some respects to the intensification of the disease.

It sometimes happens that cases occur in which the patient is known to have been exposed to the influence of scarlatina weeks or even months before the onset of labour, but in which the disease does not break out until after delivery. Now, as I said before, it by no means necessarily follows that the poison entered the system at the time when exposure is known to have occurred, for either it may have remained stored away in one or more of the various surroundings of the patient, or have been derived from quite another source (not suspected) until shortly before or after delivery, when, the patient being in a peculiarly receptive state, it readily finds an entrance into the system. That similar anomalies, instances of which must be familiar to everyone, occur quite as frequently in association with ordinary scarlatina, without it being found necessary to assume an exceptional latency, detracts much from the evidence which has been adduced from such cases in favour of a prolongation of the incubation period during pregnancy. Though I am not prepared absolutely to deny a prolonged incubation to scarlatina in the pregnant state, the cases which have come under my notice, and in which the period of exposure could be ascertained, though they only afford negative evidence, certainly do not tend to bear out this idea. In only one of the five cases could the incubation period have been prolonged for more than eight days before labour, even if infection had occurred on the very first day of exposure. Reference to the remaining case, which was exposed to two separate sources, shows that though the disease may have been derived from the first, which extended mainly from the twenty-eighth to the fifteenth day before delivery, it most probably owed its origin to the second source of infection, which was not available till five days before delivery.

To put forward a supposed latency of exceptional duration, in order to explain the onset of scarlatina soon after delivery, appears to me to be going out of the way, if I may so express it, but, if it be assumed that during the

early months of pregnancy the likelihood of scarlatinal infection is little if at all greater than in the non-pregnant state, but that this exceptional liability is for some reason or other acquired shortly before the onset of labour, the facts are quite as easily explained.

Further, from the above table other evidence may be adduced, which will also in part account for the appearance of scarlatina early in the puerperium.

Groups II and III, in which the poison presumably entered the system before labour, contain two cases in which delivery occurred about a month, and several others in which it may have occurred a few days before the proper time.* It seems possible, then, that the poison of scarlatina, like that of smallpox, may, occasionally at any rate, determine the onset of labour prematurely, and even before the symptoms of the disease have had time to develop. In Case XVI labour may have been induced by changes inside the uterus resulting from death of the fœtus as the result of scarlatina.

Moreover, it is worthy of note that in the cases comprised under Group III, and in which the poison probably entered the system before labour, the disease manifested itself from three to six days after delivery, whereas in three of the cases included under Group IV, and in which the poison presumably did not enter the system till some hours after labour, the scarlatinal manifestations appeared within three days after labour. Considerable latitude must undoubtedly at all times be allowed for the development of scarlatinal poison, but even if sixty-six to seventy-two hours be regarded as the established incubation period of the disease under ordinary circumstances, two of the three cases certainly fall considerably below the minimum. It seems possible, therefore, that when infection takes place during or shortly after labour, the incubation period may be shortened. And this suggests the question,

* Olshausen points out that "the outbreak of scarlatina during pregnancy led in at least four cases out of seven to premature delivery" (conf. 'Hervieux,' p. 1078).

whether, if such be the case, the poison may have been conveyed direct to the patient through the genital passages, instead of entering by the usual channels,—whether in fact this shortening of the incubation period may not be due to direct inoculation? Possibly in some instances it may be so. Another explanation, however, may be found in the altered conditions which exist after delivery, and this seems the more probable. To the subject of direct inoculation I shall have occasion to refer presently.

On the various questions which have been raised, owing to the inherent difficulties of the subject, it is impossible to draw any precise conclusions, and the number of cases available for the purpose is but a small one. I have not included in the paper all the cases of scarlatina which have a bearing on this subject, whether seen in hospital or elsewhere; the above are all of which I can furnish complete notes, but as far as they go, they all tend to bear out the opinions which I have already adduced. I trust that the extended experience of others, both now and in the future, may be called forth to supplement these cases.

The main points to which it has been my object to draw attention may be briefly summarized as follows:

(1) As regards the time with reference to labour at which the disease shows itself:

(*a*) That scarlatina almost invariably occurs within the first week of the puerperium, and its occurrence at a later period is extremely rare; and

(*b*) That in exceptional instances scarlatina may show itself during pregnancy, shortly before the onset of labour.

(2) As regards the liability of pregnant and parturient women to scarlatinal infection and the reciprocal influence existing between the latter and parturition:

(*a*) That a woman exposed to the disease may become infected with scarlatina during pregnancy, during or after labour.

(*b*) That the liability to infection is especially marked

shortly before, and during the first few days after delivery, but does not extend far into the puerperium.

(*c*) That if infection occur during pregnancy, the onset of labour may be thereby precipitated.

(*d*) That, when infection takes place during or shortly after labour, the incubation period may be shortened; and finally—

(*e*) That the foregoing considerations are in themselves sufficient to explain the frequent onset of scarlatina during the first week of the puerperium, without the necessity of ascribing to scarlatina in pregnancy an incubation period exceeding that of ordinary scarlatina.

II. *The Relation of Scarlatina to Menstruation.*

(Received 1st July, 1887.)

(*Abstract.*)

THE author points out that an apparent analogy with regard to the onset of scarlatina exists between labour and the menstrual periods. Careful observations were made on a separate series of sixteen cases of scarlatina in non-pregnant and non-puerperal women. These are classified and presented in a tabular form (see Table B).

Upon this evidence it appears that women usually fail with scarlatina shortly after, during, or just before a menstrual period, as in the case of labour.

In conclusion, the author suggests that the following considerations (exactly analogous to those which refer to the intimate connection existing between the time of the onset of scarlatina and delivery) may serve to explain these facts:

1. That the liability to infection is especially marked shortly before, during, and immediately after a menstrual period.

2. That infection occurring shortly before a menstrual period may precipitate the flow.

3. That, when infection takes place during or shortly after a menstrual period, the incubation period may be shortened.

The annexed table (B) refers to a series of cases of ordinary scarlatina occurring in women between the ages of sixteen and thirty-five, admitted to the London Fever Hospital under the care of Drs. Cayley and Barlow, through whose courtesy I am enabled to make the following observations. It is interesting to note that the facts set down in the table tend to indicate that an exact analogy exists with regard to menstruation. For of the sixteen cases of which notes were taken, six had finished menstruating shortly before the illness began, at periods varying from one to ten days before the onset of scarlatina (the days were ten, seven, five, two, one, and one). In all of these menstruation occurred at the expected date and did not recur during the illness until it was again due. The remaining ten patients were all menstruating during the first seven days of the illness (periods commenced two days before, one day before, same day, second, second, second, third, fifth, seventh, and seventh day of attack respectively). The date of the cessation of the period varied from the fourth to the ninth day of the illness. Supposing, by way of example, that all these sixteen patients had failed with scarlatina on the same day, they would all have commenced to menstruate within a limited period of twenty-one days. Now, as the average time at which under ordinary circumstances the menstrual periods recurred in this same set of patients is certainly not less than twenty-eight days (calculating from the commencement of one period to the commencement of the next), some special relation in point of time appears to exist between the onset of scarlatina and the occurrence of the menstrual periods. This surely cannot be a mere coincidence. Further, though in four of the ten patients who menstruated during the attack the period came on at the expected date, in three patients who were ordinarily quite regular it commenced before the usual time, in one

B.—*Chronological Relation existing between Onset of Scarlatina and Menstrual Periods.*

No. in series.	Onset of scarlatina.		Alteration in menstrual periods.	
			Rhythm.	Duration and daily amount.
V	13 days (After period began)	10 days (After period ceased)	Expected time	Unaffected, unaltered.
XV	12 „	7 „	„	„ „
I	12 „	5 „	„	„ „
IV	7 „	2 „	„	„ „
XI	4 „	1 „	„	„ „
VII	5 „	1 „	„	„ „
X	2 „ (After period began)	4 „ (After period ceased)	? (Always irregular)	„ increased.
VIII	1 „ (After period began)	6 „ (After period ceased)	Expected time	5 days longer than usual, unaltered.
XIV	Coincident with onset of period	4 „ (Before period ceased)	Probably before time *	Unaffected, unaltered.
XVI	2 days (Before period began)	5 „ (Before period ceased)	Week before time	„ „
II	2 „ (Before period began)	5 „ (Before period ceased)	„	2 days less than usual, unaltered.
VI	2 „ (Before period began)	6 „ (Before period ceased)	Expected time	Unaffected, unaltered.
III	3 „ (Before period began)	6 „ (Before period ceased)	Nearly fortnight before time	„ „
IX	5 „ (Before period began)	8 „ (Before period ceased)	Expected time	4 days less than usual, much diminished.
XII	7 „ (Before period began)	8 „ (Before period ceased)	Probably before time †	Unaffected, unaltered.
XIII	7 „ (Before period began)	9 „ (Before period ceased)	Expected time	4 days less than usual, unaltered.

* Usually 2–4 weeks—came on at the fortnight.

† Usually 5–7 weeks—came on at 5 weeks.

nearly a fortnight, and in two others as much as a week. Of the three which remain it is impossible to speak with such certainty, for one was always very irregular and the other two were never quite regular (varied from two to four weeks in one instance and from five to seven weeks in the other), but it is worthy of note that even in these the period appeared at the earliest possible date.

It seems to follow, therefore, that women usually fail with scarlatina shortly after, during, or just before a menstrual period, as in the case of labour.

The following considerations (exactly analogous to those which refer to the intimate connection existing between the time of the onset of scarlatina and delivery) may also serve to explain these facts:

(1) That the liability to infection is especially marked shortly before, during, and immediately after a menstrual period.

(2) That infection occurring shortly before a menstrual period may precipitate the flow.

(3) That when infection takes place during or shortly after a menstrual period the incubation period may be shortened.

In making these remarks I merely wish to draw attention to the relation which apparently exists between scarlatina and menstruation, in the hope that it will be further elucidated, for as far as I can learn no special observations have been made on the subject. That smallpox will determine menstruation, or, at any rate, a sanguineous flow from the uterus, is generally recognized, but no mention has, I believe, been hitherto made of the possibility of scarlatina acting in a similar way.

III. *Clinical Course of Scarlatina during Pregnancy and in the Puerperal State.*

(Received 1st July, 1887.)

(*Abstract.*)

After briefly referring to the difficulties attending the diagnosis in many cases of scarlatina occurring during the lying-in period, the author, before entering into a consideration of the clinical features of the disease, reiterates the necessity of dissociating those cases in which the attack begins before delivery from those in which it commences after the onset of labour.

The initial symptoms are discussed, and will be found in the appended table (see Table C). Attention is directed to the special character of the throat affection, and the following observations are presented:

1. That *during pregnancy* the throat symptoms are unmodified, but that after delivery angina is rare.

2. That in scarlatina *after delivery*—

(*a*) Subjective soreness is usually absent at the outset, and even at a later stage rarely causes much distress.

(*b*) Signs of slight inflammation, though generally absent at the outset, may usually be observed on the second or third day of the attack.

(*c*) The cervical glands are usually affected, whether any change has been apparent in the throat or not.

The fallacy of adducing from the diminished intensity of the throat affection an argument in favour of direct inoculation of the poison through the parturient passages is pointed out.

Attention is also directed to the slight intensity of the tongue affection, and to the marked flushing of the face which precedes the rash. These also appear to be features of scarlatina developed *post partum* but not of *ante-partum* scarlatina.

From these observations it is concluded that some modifying influence, the nature of which is unknown, is called into play at the time of delivery.

The peculiarities of the eruption are discussed with especial reference to site and intensity. Its modifications are attributed to the altered circumstances of the patient after delivery. The frequent occurrence of sudamina and urticaria is also noted.

A summary is given of the various complications which the scarlatinal patients presented. Mention is also made of the influence of a previous attack of scarlatina, and of the lapse of time after delivery in diminishing the severity of the disease.

With reference to the clinical course of the disease, as represented by the sixteen cases contained in the tabulated series already published, I would point out that during each patient's stay in hospital, no matter what her condition, she was overhauled daily for the first week, and a note was made at the bedside of the condition of each organ, whether that organ were healthy or not. And even after the first week, unless the case were progressing in every way satisfactorily, the same precaution was observed. Thus, the first indication of any change was systematically reported, in many instances long before any conclusion could be drawn as to the ultimate nature of the case. It is important to bear this in mind, for had it not been for a full and systematic daily report, I feel convinced that the true nature of several of these cases would have escaped observation. Link by link the chain was forged, but, until several such links had been carefully joined together, the diagnostic chain was not rendered complete.

Is it a matter of surprise, then, that in private practice many of the slighter cases should escape detection? And is not the likelihood of this still further increased by the current opinion that scarlatina in the puerperal state is necessarily a very dangerous disorder, associated with a high mortality? Add to this the fact that some of the characteristic symptoms, such as the sore-throat, are often so diminished in intensity as to invite no attention, while others, such as the eruption, undergo more or less modification, and further, that the true nature of the disease may be masked by grave complications incidental to the

puerperal condition, and the diagnosis becomes exceedingly difficult. It is therefore liable to be swayed rather by the ultimate result than by a careful piecing together of the symptoms and of the antecedent conditions. It is this fact which has induced me to enter into a detailed account of each case. It may be urged, and with some show of reason, I admit, that many of these cases are of unusual lenity (for the epidemic then prevailing was of mild type), and on that account cannot be regarded as fair samples of the affection. Be that as it may, the series, at any rate, is perfect as far as it goes, and in severity compares not unfavourably with other cases which have been reported *in a series*. And the evidence deduced from any series, I look upon as possessing far more intrinsic value than that derived from any number of selected cases. Dr. Braxton Hicks very pertinently observes that the cases brought forward by him, "having been seen in consultation, were naturally of the severer sort." But what shall be said of those embodied in the 'Collective Investigation Record'? Do not they naturally meet with the same objection? Are not they, for the reasons above stated, at any rate liable to contain a large percentage of the severer sort?

In considering the symptoms of scarlatina as it appears during pregnancy and in the puerperal state it is necessary again to dissociate those cases in which the attack begins before delivery, from those in which it begins after the onset of labour. For, as I remarked before, at delivery the existing conditions are profoundly altered. And, I may say at once, that the pregnant state, as long as it lasts, appears to exert no special influence on the manifestations of the disease; for the symptoms up till the time of labour differ little, if at all, from those which characterize ordinary scarlatina, but, as soon as the pregnant gives place to the puerperal condition, certain symptoms at any rate undergo modification. This deviation from the usual type is chiefly manifest in the characteristics of the tongue, of the throat, and of the eruption.

From the following table (C) it will be seen that the symptoms noted at the onset of the attack are very varied, but that, generally speaking, they differ little from those observed in non-puerperal patients attacked by scarlatina. The most marked feature is the total absence of sore-throat in most of the cases. Comparing these with the same number of patients attacked by scarlatina apart from pregnancy and the puerperal state, but of similar ages (varying from 16 to 35), *i. e.* the series of cases on which observations were made with reference to the menstrual function, a marked difference was apparent, for sore-throat was found in every case to be one of the earliest symptoms of which complaint was made, and, if not sore at the very outset, the throat almost invariably became so on the following day, so much so indeed that great difficulty was experienced in swallowing.

In none of the patients who failed with scarlatina *after delivery* was subjective sore-throat a prominent symptom. Indeed, in every case it was altogether absent at the outset, and in four cases only was sore-throat complained of subsequently. Nevertheless, careful observation revealed the fact that in almost every case some change occurred in the throat about the second or third day of the illness, even though no discomfort was at the time experienced by the patient.

It is, however, noticeable that in two of the three cases which failed with scarlatina *before labour* the throat symptoms were well marked. In one, subjective sore-throat was present at the outset, two days later it became a prominent symptom, and was then accompanied by marked changes in the throat. In another, subjective sore-throat was present on the second day of the illness, but, as the patient's throat was not examined at the time, it is impossible to say whether any definite changes were then present. In the third case none of the symptoms were marked, and no subjective sore-throat was present.

In nearly all of the cases which I can find in which scarlatina made its appearance before delivery, as far as

C.—*Table of Initial Symptoms of Scarlatina.*

	(a). Cases which failed after labour.													(b). Before delivery.		
	I.	II.	III.	IV.	V.	VI.	IX.	X.	XI.	XII.	XIII.	XIV.	XV.	VII.	VIII.	XVI.
Chill	×	...	×	...	...	...	×	×	...	...	×	...	×	×	×	...
Sleeplessness and disturbed sleep	...	×	×	...	×	...	×	...	×	...	×	...	...	...	×	×
Restlessness	...	...	×	...	×	...	...	...	...	×	...	...	...	...	...	...
Muscular twitching	...	...	×	...	...	...	...	...	...	...	...	...	...	...	...	...
Slight delirium	...	...	...	...	...	...	...	...	...	×	...	...	...	...	×	...
Malaise and lassitude	...	×	...	...	...	...	...	...	...	...	...	...	...	...	×	×
Mental depression	×	...	...	...	×	...	...	...	...	×	...	...	...	...	...	...
Frontal headache	×	...	×	×	×	...	×	×	×	×	×	...	...	×	×	...
Giddiness	...	...	...	...	...	...	...	...	...	...	...	...	×	×	...	...
Aching in limbs and backache	...	...	...	...	...	...	...	...	...	×	...	...	...	×	×	...
Furred tongue	...	...	×	...	×	...	...	...	×	...	...	×	×	×	...	...
Anorexia	...	...	...	...	...	...	×	...	...	...	...	...	...	×	×	...
Nausea and vomiting	...	...	×	...	...	...	...	...	×	...	...	...	×	×	×	×
Flushing of face	×	...	×	×	×	...	×	...	×	×	×	×	×	...	*	...
Suffused conjunctivæ	...	...	...	...	×	...	...	...	...	...	...	×	...	...	×	...
Sore-throat (subjective)	...	...	...	...	...	...	...	...	...	...	...	...	...	†	×	...
Stiffness of neck	...	...	...	...	...	...	...	...	...	...	...	...	...	×	...	...
Swelling of hands and feet	...	...	...	...	...	...	...	...	...	...	...	...	...	...	×	...

× Indicates presence of symptom. * During labour, 2 days after onset. † Day following onset.

one can judge from the descriptions given, sore-throat seems to have been a prominent symptom at the outset.

From a consideration of the foregoing cases it appears reasonable to conclude—

1. That *during pregnancy* the throat symptoms are unmodified, but that after delivery angina is rare.

2. That in scarlatina *after delivery* (*a*) subjective soreness is usually absent at the outset, and, even at a later stage, rarely causes much distress; (*b*) signs of slight inflammation, though generally absent at the outset, may usually be observed on the second or third day of the attack; (*c*) the cervical glands are usually affected, whether any change has been apparent in the throat or not.

Those who regard the throat as the part through which the scarlatinal poison enters the body, and look upon the inflammatory process therein set up as the initial local focus from which the scarlatinal poison spreads to the general system, may seek in the diminished intensity of the sore-throat after delivery an argument in favour of direct inoculation of the poison through the parturient passages. If not only the subjective symptom of soreness, but also the signs of inflammation in the throat itself, and in the neighbouring lymphatic glands, were entirely absent, some *primâ facie* ground might be found for accepting this view.

It rarely happens, however, that all signs of inflammation are entirely absent; the modification is one merely of degree. But, further, the mere fact that in many cases of scarlatina developed after delivery, and accompanied by slight throat symptoms, the poison entered the system before the onset of labour, negatives at once the supposition of its entrance through the parturient passages, and removes the grounds for any argument based on such hypothesis.

Not only the throat but the tongue also participates in this unknown modifying influence, which is called into play subsequent to delivery. For it is noted that, in two

of the three cases which failed with scarlatina *before delivery*, the tongue presented the characters usual to the existing stage of the disease at the time when the patients were seen, but in no single instance *after delivery* did the tongue take on a typical scarlatinal character; in five cases only were the papillæ at all enlarged, and in several the tongue was not even coated with fur.

Marked flushing of the face was also observed as a prominent and very general symptom at the onset of scarlatina in the puerperal patients. This symptom, though absent at the outset, also supervened during the course of labour in one of the patients who failed shortly before delivery. In the others it was either entirely absent or escaped detection.

To the diminished intensity of the sore-throat, to the slight changes shown by the tongue, and to the marked flushing of the face which precedes the eruption, attention has already been drawn by others. The cases which have fallen under my own observation entirely bear out the fact that these manifestations, for some reason or other, undergo modification in the puerperal state, but, further than this, they at the same time go far to prove that it is not until labour that the modifying influence is brought into play. The few cases of scarlatina developed during pregnancy, which have been reported by others, also tend to confirm this. The *rationale* of these modifications still awaits a satisfactory explanation.

To the eruption also certain peculiarities have been attributed in scarlatina following delivery. Speaking generally, it may be said that the period of invasion is curtailed. The eruption not only makes its appearance early, but spreads rapidly, invading the whole body in a few hours. Moreover, instead of the chest, neck, and upper limbs, the rash usually selects the lower part of the trunk, the abdominal wall, the flanks, the loins, the buttocks and upper part of the thighs as its primary seat. Not infrequently also sudamina appear. These peculiarities have been previously noted, and the explanation

of them is obvious. The development of the scarlatinal eruption is under ordinary circumstances pre-eminently favoured by external warmth; consequently, as might be expected, it is especially in those parts which are closely covered by the binder, and when a fomentation has been applied, on the anterior abdominal wall more especially, that the rash appears first and in greatest intensity. This is in fact what happens. In all the six cases in which fomentations were applied to the abdomen, the eruption appeared early (in three cases on the first day of the attack), and was at first peculiarly limited to, and subsequently of greatest intensity at, the seat of the application. Thence it spread, in accordance with the extent of the binder, to the flanks, buttocks, and loins, and then to the rest of the body, showing a preference, however, for the upper and inner part of the thighs in contact with the pad, for the back in contact with the bed, and for the fold of the breasts, to more exposed parts of the body. The mere fact of the patient being kept warm in bed from the very outset is sufficient to account for the rapidity of the spread; so marked indeed was this in some cases that the whole body had practically become invaded when the eruption was first observed. In four cases sudamina were present. The moist state of the skin during the lying-in period, and the especial liability to the supervention of diaphoresis, when the temperature declines, afford a ready explanation of the frequent association of sudamina with the scarlatinal eruption.

Several of the cases, moreover, were complicated by an evanescent itching, papular, and sometimes blotchy eruption, possessing a special proclivity for the knees and elbows. This rash was found to occur in some cases during the height of the scarlatinal eruption; at others either before or after it. In character the rash differed in no respect from those other evanescent eruptions so common in the puerperal condition, and apparently depending in part upon sudden decline of temperature and free perspiration, and in part upon intestinal irrita-

tion. This rash, of which in association with the scarlatiniform eruption, I can find no special mention elsewhere, may justly be regarded as an accidental complication of scarlatina.

In all the sixteen cases of scarlatina desquamation occurred, and in character and distribution presented great individual variety.

Among the complications commonly mentioned in association with scarlatina, it may be noted that albuminuria frequently occurred after the acute symptoms had subsided. Indeed, in most of the cases in which the urine was examined regularly, slight albuminuria was detected, and probably would have been observed in others had the examination been continued into the second week of the illness. In two cases at least the renal affection was considerable, and in one of them dropsy, uræmic vomiting, and convulsions supervened during the fifth week after delivery. Bearing in mind the frequent association of renal changes with pregnancy, the supervention of scarlatina might reasonably be expected to exert a malign influence on the kidneys.

Articular rheumatism was noted in one case on the ninth day of the illness. It readily yielded to salicylate treatment.

Slight secondary throat affection occurred in two cases after the primary throat had entirely subsided.

Pleuritic friction accompanying inspiration was observed in one case on the third day of the illness. It was attended with considerable increase in the frequency of the respirations, and with slight cough. It persisted for nearly three weeks. In another case pleuritic effusion was present at the outset; apparently, however, it was an accidental complication of scarlatina, and there is reason to think that it had existed for some time previously.

In none of the cases was any marked change observed in the heart, and in one case only was the pulse-beat augmented in frequency at the onset out of proportion to the increase in temperature.

Diarrhœa, upon which much stress has been laid by some observers, was in no case a prominent symptom. Constipation prevailed as a rule, but was not more marked than in the generality of lying-in patients of the poorer class.

In this place I may mention that ten out of the sixteen patients are reported to have had scarlatina before, and one of them twice before. The two patients who suffered most severely (Cases III and VII) are said never to have had the disease before. Generally, it may be said that on those who had had a previous attack the disease fell very lightly. The relation in point of time of the onset of scarlatina to delivery appeared to exert no appreciable influence on the severity of the attack. Olshausen, however, has shown that, taking a large number of cases, the earlier the disease appears after delivery the greater the mortality. All the sixteen patients recovered.

IV. *Effect of the Scarlatinal Poison on the Course of Labour.*

(Received 1st July, 1887.)

(*Abstract.*)

An epitome of the course of the labour is given, both of those patients who were delivered during the incubation period and also of those who were delivered during the actual attack of scarlatina. The following conclusions are adduced:

1. When labour occurs *during the incubation period* of scarlatina, it runs for the most part its usual course, but the pains may exert a greater influence than usual on the mental condition of the patient; inertia, if induced, sets in late in the course of labour, and a peculiar and almost characteristic odour may be present.

2. When labour occurs *during an attack* of scarlatina, the pains are apt to be feeble throughout, inertia sets in early, and

post-partum hæmorrhage is liable to occur. The same peculiar odour may be present.

The possibility of scarlatina determining the premature onset of labour has been already mentioned. It now remains to consider the effect of the poison on the course of labour.

By reference to the previous table (see Table A) it will be perceived that five patients (Group III: Cases I, III, IV, V, VI) presumably received infection previous to admission to the hospital, and therefore prior to the commencement of labour (or, in other words, that labour occurred during the incubation period), and also that two other patients (Group I: Cases II, IX) may possibly be placed in the same category.

In none of the cases included under these two groups did inertia set in until after the child was born, but in three (Cases I, III, V), though the pains were of moderate strength, duration, and regularity, their effect on the mother was so marked that in each a special note was made of the extent to which the patient rolled about, and of the extreme difficulty experienced in managing her. In Cases V and VI inertia set in during the third stage, and the loss in each instance exceeded twenty ounces. In the same two cases during labour a peculiar faint odour was observed. This, though not easily described, may be compared to "sweating apples," and was quite distinct from that of ordinary decomposition.

By reference to the same table, it will also be seen that three patients (Group II: Cases VII, VIII, XVI) had already failed with scarlatina when labour set in (or, in other words, that labour occurred during the attack).

In these three cases the pains were feeble and irregular throughout the whole course of labour, and the loss was somewhat excessive. In Case VIII, again, the patient rolled about much.

With reference to the two remaining cases of the same group, it will be seen that one patient (Case XIII) failed

with scarlatina early in the course of labour. In this case the pains were also feeble throughout, and the loss exceeded thirty ounces. Here again the same peculiar odour was observed, and this determined me in isolating the patient at once, before any characteristic sign of scarlatina had appeared. The other patient (Case XIV) failed with scarlatina eight hours after labour, and, though suffering from fluid pleurisy and fever on admission, the pains were of a normal character, and no excessive loss took place.

Conclusions.—(1) When labour occurs *during the incubation period* of scarlatina, it runs, for the most part, its usual course, but the pains may exert a greater influence than usual on the mental condition of the patient; inertia, if induced, sets in late in the course of labour; and a peculiar faint and almost characteristic odour may be present.

(2) When labour occurs *during an attack* of scarlatina, the pains are apt to be feeble throughout; inertia sets in early, and post-partum hæmorrhage is liable to occur. The same peculiar odour may be present.

V. *Effect of the Scarlatinal Poison on the Puerperium.*

(Received 1st July, 1887.)

(*Abstract.*)

Two tables are given; one represents the effect of scarlatina on the uterus and lochia, the other shows its effect on the mammary secretion (see Tables D and E).

The nature of the slight and evanescent tenderness over the uterus, frequently noted quite at the outset of the attack, is briefly discussed.

Particular attention is directed to the character of the lochia, and a suggestion is put forward that offensiveness might have occupied a more prominent position if local antiseptic measures had been omitted during the puerperium. In the majority of cases an increased flow was observed at the onset of scarlatina.

The cause of this is discussed, and a similar increase of the menstrual flow on the supervention of scarlatina is noted (see Table B).

A brief review of the mammary function is given. The liability of the infant (when the mother is affected) to take infection is discussed with special reference both to the question of suckling (which necessarily implies direct contact with the mother) and also to the stage of the disease at which delivery of the mother takes place.

The following conclusions are offered:

(1) That involution of the uterus is not much, if at all, retarded.

(2) That the slight and evanescent tenderness over the fundus, occasionally present at the very outset of the attack, is often due to exalted sensibility of the pelvic organs, and is rarely an indication of pelvic inflammation.

(3) That, provided antiseptic precautions be taken, lacerations heal without difficulty, and the lochia as a rule do not become offensive.

(4) That in some cases a peculiar unpleasant odour may be observed.

(5) That the lochia usually proceed naturally and cease about the usual time, but in many cases become red and free at the outset of the attack.

(6) That the mammary secretion is frequently diminished and sometimes arrested, as the result of the illness.

(7) That infants kept at the breast are especially prone to scarlatina, probably from the mere fact of contact with the affected parent.

(8) That when scarlatina shows itself in the mother during pregnancy the fœtus may or may not be affected *in utero*.

(9) That when the mother receives infection shortly before delivery the infant more generally escapes, though it may be subsequently infected.

Olshausen ('Obst. Journ.,' vol. iv, p. 364) says: "The usual functions appertaining to the puerperal state, such as lochia, secretion of milk, involution of the uterus, proceed, in the great majority of cases, without any dis-

turbance. Only a moderate tenderness of the uterus, which rapidly disappears, is noticed in a small number of cases, quite at the commencement of the scarlatina. Inflammatory affections of the pelvic organs are of the greatest rarity, and are only to be regarded as casual complications. . . . No mention is made anywhere of hæmorrhage from the uterus, such as occurs in variola or typhus after delivery."

From the following table (D) it is evident that in the sixteen patients attacked by scarlatina no very marked effect on the involution of the uterus was exerted. After-pains were neither of more frequent occurrence nor of greater severity than in non-scarlatinal puerperæ. Ten-

D.—*Effect of Scarlatina on Uterus and Lochia.*

Case.	Abdominal tenderness.	Fundus.	Offensive lochia.	Loss at onset of scarlatina.	Lochia ceased.
I	Slight ii, iii, iv	Steadily declined	No	Sudden increase	xii.
II	„ ii—viii (slight cystitis)	Little high at outset	No	„	x.
III	„ ii—ix, *left side	Declined quickly	No	„	x.
IV	„ ii, left side	High at first	No	„	xiii.
V	None	Declined naturally	No	„	xi.
VI	Very slight iii, left side	High	Peculiar from labour	„	xi.
VII	Slight iii (bladder)	?	No	—	viii.
VIII	„ ii—iv	?	No	—	iv.
IX	„ i—iv	Rather high	Peculiar after onset	Sudden increase	(9 weeks)
X	„ (bladder)	?	No	No increase	vii.
XI	None	Declined naturally	No	Sudden increase	xiv.
XII	„	„	No	Free from labour	?
XIII	„	?	Peculiar from labour	—	?
XIV	„	Declined naturally	No	No increase	?
XV	Convalescent after natural puerperium when attacked.				
XVI	Slight i—iii	High 1st week	No	—	xiv.

* xii, general peritonitis. Tenderness and distension diminished, xvii.

derness over the lower part of the abdomen also was not more pronounced in scarlatinal than in non-scarlatinal patients. Slight tenderness over the uterus was present in about half of the cases, but as a rule was quite evanescent, and, with the single exception of Case III, was never of such a character as to give rise to any suspicion of pelvic inflammation. Its occurrence in a few cases quite at the onset of the attack, and even before any rise of temperature had occurred, may, I think, be regarded as evidence of the exalted sensibility of the pelvic organs, comparable to that which is found to occur during labour in patients previously infected, even before the attack has become manifest. This exalted sensibility may be produced either directly by the poison in the blood, or indirectly by a temporary relaxation of the uterine tissue. Peritonitis, setting in late in the puerperium and following the onset of desquamation, is a peculiar feature of grave import, which has been previously noted (see Case III, p. 18).

As regards the lochia, it may be noted that in three cases only was offensiveness distinguishable, and in these it preserved the special character of which mention has previously been made. In two of these cases this peculiar odour was noted during labour and before the development of the attack. It became, however, more pronounced subsequently. In the remaining case it was not apparent till after the attack commenced. In this connection I may remark that each patient was given an antiseptic vaginal douche two, and in some cases three times a day, until the lochia ceased. Had this been omitted, it is possible that decomposition of the lochia would have occupied a more prominent place. Lacerations about the vulva as a rule healed without causing trouble. Unhealthy ulcers, such as have been described as concomitants of scarlatina in the puerperal state, were in no instance present. Though no actual hæmorrhage occurred such as could be designated "a flooding," it is worthy of remark that in the vast majority of cases the lochia, which had previously

been scanty, and in some cases yellow, became free and red at the onset of scarlatina, and (with one exception) ultimately ceased about or soon after the usual time. The explanation of this occurrence may, I think, be found in the tendency of scarlatina, in common with other acute specific fevers, especially smallpox, to induce hæmorrhage in previously healthy tissues, such as serous and mucous membranes, and even in the skin. And when a hæmorrhagic discharge is already present, it seems but reasonable to expect that this same tendency, even though exerted to a very slight degree, would be capable of producing an increase in the flow; or, if it have but lately ceased, cause it to be renewed. Whether this effect be produced by a transitory relaxation of the uterus or by an active congestion of the organ, I am unable to determine. It is possible that both may play a part in the process. Reverting to the effect of scarlatina on menstruation (Table B), it is interesting to note that two cases (X and VIII) occurred, in which the patients commenced to menstruate two and one days respectively before the attack of scarlatina commenced. In the former the daily loss was increased; in the latter, though the daily loss was unaffected, the period persisted for an extended time.* On the other hand, in several of the patients who commenced a menstrual period just after failing with scarlatina, the period was curtailed, and in one case the daily loss was also diminished. Both of these divisions stand out in marked contrast with those cases in which the period had ceased shortly before the onset of scarlatina.

Interference with the due performance of the mammary function might be expected to occur on the supervention of an acute illness such as scarlatina.

Reference to the following table (E) shows that in a a few of the cases the milk supply proceeded without

* Since the above was written an article by Dr. Mantle, headed "The Occurrence of Menorrhagia and Metrorrhagia during the Febrile State," has appeared in the 'Lancet,' June 18th, 1887, p. 1227.

interruption, but in several it diminished after a few days, and in a few ceased altogether. In one case, however, little milk was secreted for a fortnight, but then became plentiful. All the live-born children remained with their mothers throughout the illness and were put to the breast. Three were suckled throughout without contracting scarlatina; and six suckled during a variable period (a few days to two months) were also unaffected. In one case in which the child was unaffected no account of the suckling is preserved. Three children who were kept at the breast were affected by scarlatina, and one of these died. Another infant, which was only put to the breast directly after delivery, was also attacked by scarlatina and

E.—*Effect of Scarlatina on Mammary Secretion.*

Case.	Milk appeared.	Supply.	Feeding of child.	Result to child.
I	iii	Unaffected	Suckled throughout	Unaffected.
II	iii	Diminished vii	„	„
III	ii	Diminished viii, ceased xv	Suckled till xv	„
IV	iii	Diminished viii	Suckled till death	Ill iv; died vii; probably scarlatina.
V	iii	Unaffected	Suckled till vi	Unaffected.
VI	iii	Diminished viii, ceased xi	Suckled till xi	„
VII	—	Belladonna applied after labour	—	Child died during labour (appeared healthy).
VIII	iii	Belladonna applied i	Put to breast i only	Ill soon after delivery; died viii.
IX	ii	Diminished vii	Suckled throughout	Unaffected.
X	iv	Diminished vi, re-established xviii	„	Ill about xxi; recovered.
XI	ii	Unaffected	Suckled 2 months	Unaffected.
XII	iii	Ceased vii	Suckled till vii	„
XIII	iii	?	?	„
XIV	iii	Ceased about vii	Suckled 5 days	„
XV	—	Unaffected	Suckled throughout	Ill about xlvi; recovered.
XVI	iii	Belladonna applied ii	—	Child stillborn (possibly intra-uterine scarlatina)

died, but in this case it is probable that infection took place *in utero*. Of the two stillborn children one possibly succumbed to intra-uterine scarlatina.

It appears, therefore, that four out of fourteen live-born infants were affected with scarlatina with two deaths. In each case the child's illness followed that of its mother, and with one exception the infant was at the breast when attacked. Whether the milk, *per se*, by acting as a carrier of infection, may have increased the risk due to contact alone it is impossible to determine. It is noteworthy, however, that though many other infants—to the number of thirty or more—were to a greater or lesser extent exposed, not one of them took scarlatina. Under these circumstances the advisability of removing the infant from direct contact, which necessarily implies removal from the breast, appears to be established. On this point the opinion of the Society is particularly invited.

It is generally admitted that the fœtus may be infected by the poison of the exanthemata while *in utero*. The disease may declare itself in the infant either before or subsequent to delivery. Leah ('Bos. Med. Surg. Journ.,' 1884, p. 445) reports a case in which scarlatina declared itself simultaneously both in mother and child at birth. In Case XVI the fœtus was possibly affected by the scarlatinal poison *in utero* at about the time at which the mother was attacked.

In Case VIII the mother failed two days before delivery and the infant within twenty-four hours after birth. But in Case VII, though the mother failed nine days before delivery, the fœtus was alive and apparently healthy at the onset of labour. Thus, it appears that, as in the case of smallpox, *when the mother is attacked prior to delivery* the fœtus may escape infection but frequently participates in it.

The chance that the fœtus may escape appears to be much greater in those cases in *which the mother is infected before but the disease does not show itself till after delivery*, for out of seven cases which fall under that head (see

Table A, Group III) in one only (Case IV) was the infant attacked. In that case the mother failed seventy-four hours after delivery and the infant's illness commenced about the same time.

In two cases (X and XV) the mother was not infected before delivery. In one the child failed a fortnight and in the other three weeks after the mother's illness commenced. It is further remarkable that in both instances these infants recovered, whereas the other two died.

The conclusions offered are as follows :

1. That involution of the uterus is not much, if at all, retarded.

2. That the slight and evanescent tenderness over the fundus occasionally present at the very outset of the attack is often due to exalted sensibility of the pelvic organs, and is rarely an indication of pelvic inflammation.

3. That, provided antiseptic precautions be taken, lacerations heal without difficulty, and the lochia as a rule do not become offensive.

4. That in some cases a peculiar unpleasant odour may be observed.

5. That the lochia usually proceed naturally and cease about the usual time, but in many cases become red and free at the onset of the attack.

6. That the mammary secretion is frequently diminished and sometimes arrested as the result of the illness.

7. That infants kept at the breast are especially prone to scarlatina, probably from the mere fact of contact with the affected parent.

8. That when scarlatina shows itself in the mother during pregnancy the fœtus may or may not be affected *in utero*.

9. That when the mother receives infection shortly before delivery the infant more frequently escapes, though it may be subsequently infected.

ANNUAL MEETING.

FEBRUARY 1ST, 1888.

JOHN WILLIAMS, M.D., President, in the Chair.

Present—54 Fellows and 1 Visitor.

The President declared the Ballot open for one hour, and appointed Dr. Dakin and Dr. H. R. Spencer as Scrutineers.

Books were presented by Mr. Alban Doran, Dr. Priestley, the Edinburgh Obstetrical Society, and the Middlesex Hospital Staff.

Dr. Percy Boulton presented a normal female pelvis and fœtal head to the Museum.

Henry Frederick Bailey, M.R.C.S.; Arthur W. Galloway, L.R.C.P.Lond.; Herbert R. Spencer, M.D.; and Henry George Sworn, L.K.Q.C.P. and L.M., were admitted Fellows.

James A. Fraser, L.R.C.P.Lond. (Romford); George John Morgan, L.K.Q.C.P. and L.M. (West Felton); and Norman Rushworth, L.R.C.P.Lond. (Walton-on-Thames), were declared admitted.

James Armstrong, M.B.Edin. (Liverpool), was elected a Fellow of the Society.

The following gentlemen were proposed for election :— Henry Briggs, M.B. (Liverpool) ; Peter Cooper, L.R.C.P. Lond. (Blackheath) ; Thomas Babington Grimsdale, B.A., M.B.Cantab. (Liverpool) ; Guy Carleton Jones, M.R.C.S. ; and Patrick Cumin Scott, B.A., M.B.Cantab. (Blackheath).

UTERINE TUMOURS.

By W. A. Meredith.

Mr. Meredith showed two large uterine tumours, successfully removed by supra-vaginal hysterectomy. The specimens were exhibited for the purpose of illustrating the fact that interstitial or shortly pedunculated uterine growths may undergo axial rotation to an extent involving occlusion of the cervical canal and consequent retention of menstrual discharges.

The more recent of the two specimens, removed from a patient aged 34, consisted of a pedunculated fibro-myoma closely connected with the left posterior aspect of the fundus of an otherwise normal uterus. At the operation, the tumour was found rotated one full half-turn from left to right ; what was in reality the posterior surface of the growth lying in contact with the anterior abdominal wall. The uterus was twisted on its axis in such a way as to bring the *left* ovary opposite the *right* iliac spine, while the *right* ovary lay behind the tumour to the *left* of the sacral promontory. The displacement in this instance, was of recent origin, and had not as yet led to occlusion of the cervical canal.

The larger specimen showed a median vertical section of a degenerating fibro-myoma situated in the anterior wall of a much enlarged uterus which, at the time of its removal, was filled with altered blood. The retention in this case was due to occlusion of the cervical canal, caused by partial rotation of the tumour and its subsequent

adhesion in this position to the abdominal wall. Full details of the case were given in a paper read before the Society in November, 1887.

Dr. CHAMPNEYS confirmed Mr. Meredith's statement as to the rotation of the tumour. It was twisted so that the spiral corresponded in direction with that of a corkscrew, the rotation having therefore been opposite to that described by the hands of a clock and the sun. Mr. Meredith had, he thought, somewhat understated the amount of rotation. The left ovary lay nearly opposite the right pectineal eminence, which implies more than half a circle, or, considering the normal rotation of the uterus (with the left cornu anterior), not much less than three quarters of a circle.

CARCINOMATOUS CERVIX REMOVED (WITH A PORTION OF THE PERITONEUM FORMING DOUGLAS'S POUCH) BY SUPRAVAGINAL AMPUTATION FROM A PATIENT IN WHOM ABORTION HAD BEEN INDUCED AT THE FOURTH MONTH A FORTNIGHT PREVIOUSLY.

By ARTHUR H. N. LEWERS, M.D.LOND.

The patient from whom it was taken on admission into the London Hospital was found to be rather more than four months pregnant, though she was unaware of it. On examination a large "cauliflower" mass was found occupying the vagina; it sprang from the posterior lip of the cervix by a somewhat narrow attachment. This mass was removed on December 29th, 1887, with the écraseur. The vascularity of the parts was so great that it was judged to be safer to induce abortion, and allow some time for involution to lessen the size of the vessels, before proceeding to supravaginal amputation, for which operation the case was suitable. Accordingly the cervix was rapidly dilated with Hegar's dilators, and the fœtus and placenta removed, the whole time occupied in removing

the cauliflower mass and emptying the uterus being less than an hour.

Eighteen days later supravaginal amputation of the cervix was performed, and the specimen shown removed. Douglas's pouch was opened as much as two inches transversely, and a portion of the peritoneum forming it, and adherent to the posterior aspect of the cervix, taken away. The opening in Douglas's pouch was closed with silver sutures. The patient made a good recovery.

EPITHELIOMATOUS GROWTH FROM THE CERVIX UTERI.

By C. H. Carter, M.D.

OVARIES AND JEJUNUM.

By W. A. Duncan, M.D.

Dr. William Duncan showed the ovaries and a piece of the jejunum from a patient who had been under his care and was operated on by his colleague, Mr. H. Morris, at the Middlesex Hospital.

HYPERPLASIA OF CHORION STEMS WITH PARTIAL CYSTIC DEGENERATION (MYXOMA FIBROSUM OF VIRCHOW ?).

Dr. W. Griffith exhibited this specimen, which had been sent to him by Mr. Bond, assisting Mr. J. B. Phillips, of Spital Square.*

The specimen is a portion of a kidney-shaped mass eight

* St. Bartholomew's Hospital Museum, Spec. No. 3043ᵉ.

inches long, which had the appearance when fresh of a mixed fleshy and hydatid mole. It consists almost entirely of chorion; the amnion is collapsed and compressed inside the mass, measuring about four inches in length. No remains of fœtus or cord are visible. It is covered by a thin layer of decidua, and in parts by blood-clot, which has penetrated deeply between the bundles of chorion stems.

The stems are branched, and appear as bundles of solid interlacing rods, which vary in thickness from $\frac{1}{16}$th to $\frac{1}{8}$th and even in places to $\frac{3}{16}$th of an inch in thickness. The rods are not uniformly enlarged throughout their whole length, but vary in different parts. The thickening of the stems is due to an increase of the normal myxomatous core-tissue. All the rods examined microscopically are devoid of blood-vessels; the exochorionic epithelium has in places disappeared, but in general appears to be normal.

In some places cystic degeneration (as in the common cystic mole) has occurred, but the cysts are not numerous.

The specimen is from a woman aged 39, the mother of

eight children, the last of whom was born in January, 1886. "The patient believes she again conceived in the following March, the abdomen increasing in size until October, after which there was marked decrease." (In June and July there was an occasional slight loss of blood-stained fluid.) On January 25th, 1887, the mass was expelled without any hæmorrhage, twenty-four hours after the commencement of pains.

This condition affecting a portion of the placenta in advanced pregnancy, the fœtus being born alive, was first described under the name of "Myxoma fibrosum," by Virchow, and later by Hildebrandt and Storch. In these cases the affected parts were obvious as distinct tumours of the placenta.

Dr. Sinclair, of Boston, has recorded a case apparently similar to the one exhibited, but Dr. Griffith had not been able to examine the record.

Diffuse myxoma of the non-placental chorion has been described by Breslaw and Eberth, but the absence of villi from this portion would probably render the disease of less importance as it also alters the characters of the part affected.

The conjunction in this specimen of very partial cystic degeneration with hyperplasia is of interest, but the hyperplasia, from its extreme rarity, cannot be considered as having any necessary relation to the more common cystic myxoma of the chorion.

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The progress of involution was
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C. OWEN FOWLER, M.D.Brux., L.R.
LATE HOUSE PHYSICIAN TO THE GENERAL LYING-IN

(Received Sept. 2nd, 1887.)

(*Abstract.*)

THE authors remarked that the administration of a tonic mixture containing ergot during the lying-in period had often been recommended. This recommendation was based upon a general knowledge of the action of such drugs and of the process of involution. No observations had been made, so far as the authors were aware, as to the actual effect of this treatment upon the progress of involution. The authors had sought to ascertain its effect by measuring the height of the uterus above the pubes on successive days of the lying-in, in two sets of patients—one set (fifty-eight in number) treated with an ergot mixture for a fortnight after labour, the other set (sixty-eight in number) given a single dose of ergot after labour and no more. They found that in the cases treated by the continuous administration of ergot, the uterus diminished in size more rapidly than in those in which one dose only was given. They compared the two sets of cases as to the duration of the lochial discharge, but on this they did not find that the ergot treatment produced any appreciable effect.

THE administration of a tonic mixture containing ergot during the lying-in period has been often recommended,

and doubtless practised. It is known that ergot will make the uterus contract after labour; that absence of uterine contraction is unfavourable to involution, and that ergot will sometimes diminish the size of uterine fibroids; and these facts would make one expect that ergot would accelerate involution. It is to be expected also, that whatever beneficial effects ergot may produce, would be increased by combining it with general tonics, and that such an admixture would diminish the probability of an injurious effect. Upon these grounds the use of a tonic mixture containing ergot during the period of involution has been recommended; but so far as we can find, no direct proof or evidence has yet been brought forward, to show what effect upon involution such a mixture actually has.

In this communication we bring forward observations made in the General Lying-in Hospital, to determine the point.

Every patient delivered in that institution is given a ʒj dose of the liquid extract after delivery, to more surely prevent post-partum hæmorrhage. It was not thought right to omit that precaution for the sake of this investigation. But after this, in one set of patients, sixty-eight in number, no more ergot was given; while in another set, fifty-eight in number, each patient was given a mixture containing ♏xv of the liquid extract of ergot, ♏x of tincture of nux vomica, and a grain of quinine, three times daily, during the rest of her stay in hospital. The experiment was begun with the cases in which ergot was continuously given, and every case as it came was treated in this way, without any selection. In estimating the result, one case only has been excluded, viz. one in which an attack of perimetritis followed delivery. The effect of perimetritis in retarding involution is well known, and the measurements of the uterus in this case (No. 53) show it. This case was therefore not a fair one for comparison. When fifty-eight cases had been treated in this way, a further series of sixty-eight were treated without ergot, except the

single dose after labour. The progress of involution was in each set of cases estimated by measuring with a tape the distance between the fundus uteri and the symphysis pubis. The measurements were made between ten and twelve in the forenoon, and instructions were given to the nurses to see that each patient passed water at about 10 o'clock, so that the bladder might be nearly empty when the measurement was made. On some few occasions the patients were found not to have obeyed the directions given, the bladder being full enough to be felt abdominally when the measurement was attempted. In these instances the bladder was emptied with the catheter, and then the measurement made; and these cases are shown in the table.

The method of estimating the size of the uterus by measuring its height above the symphysis was adopted as being the most convenient. There are sources of inaccuracy inseparable from it, arising from the varying fulness of bladder and rectum, from the different thickness of the abdominal wall, and chiefly from the different elevation of the uterus with regard to the pelvic brim, in different patients. But from the purely fortuitous manner in which the cases were selected for the different methods of treatment, we have no doubt that variations from the causes mentioned are practically equally distributed between the two sets of cases, and so do not vitiate the comparison between them.

In every case used for comparison the patient passed through the lying-in period without abnormal symptoms other than of a trifling kind.

The first table gives the observations made in each case, as to the height of the fundus uteri, in inches, above the pelvic brim, on different days of the lying-in.

The second table has been compiled from the first by adding up the columns for the different days, and dividing by the number of observations made, so getting the average height of the uterus above the pubes on each day, in the two sets of cases.

This table shows that while the average height of the uterus above the pubes on the second day was rather more in the cases treated with ergot (showing that the chance selection had rather worked against this set of cases, handicapping it, so to speak, in the race of involution), nevertheless on all subsequent days excepting the fourth (an exception which we can only account for by supposing an accidental selection for measurement on that day of the more tardy cases on one side, the more rapid ones on the other), in the cases treated by ergot the average height of the uterus above the pubes was less than in those treated without it; that is, that involution had gone on faster in the former cases.

To further show this, we append a third table, made in another way. It shows the number of cases on each day, in the two sets, in which the fundus uteri had sunk below the pelvic brim. This table clearly shows the earlier date on which involution was so far progressed that the fundus uteri could not be felt abdominally.

We have tested the progress of involution also by inquiring if there were any difference in the duration of the lochial discharge in the two sets of cases. The fourth table summarizes the observations as to this point.

The general conclusion to which these figures point is, that the administration of an ergot mixture during the first fortnight of the lying-in period appreciably increases the rapidity with which the diminution in size of the uterus goes on, but that it does not appreciably influence the duration of the lochial discharge.

TABLE I.—*Showing height of uterus above pubes in cases treated with Liq. Ergotæ* (ℿxv) *three times a day for the first fortnight after delivery.*

TABLE I.—*Liq. Ergotæ* (mxv) *three times a day.*

Patient's number in book.	No. of children.	1st day.	2nd day.	3rd day.	4th day.	5th day.	6th day.	7th day.	8th day.	9th day.	10th day.	11th day.	12th day.	13th day.	14th day.
35	1	...	5¾	× 4½	4	...	...	2	...	...	...	...	Brim	...	c
36	2	...	6	4	3	...	× 2	...	...	...	1	Brim	...	c	
37	4	...	8	4½	4	...	3	×	1	...	Brim	...	c		
38	1	...	8	6	5½	5	3½	...	2½	...	...	2	...	Brim	c
39	2	...	5½	5½	4¾	...	3	...	...	1½	...	Brim	...	...	c
40	3	...	7	5	×	...	3½	...	...	2	...	2	...	Brim c	
41	2	...	8	5½	× 5	...	3	...	2½	...	...	2 c	Brim		
42	2	...	3½	× 3½	3	2½	c	2½	...	1½	...	Brim			
43	7	...	7	...	× 4	...	c	3	...	2	...	...	Brim		
44	5	...	6¼	×	4½	4	...	3 c	2¼	...	1½	Brim			
45	1	...	5	...	× 4	4	2½	...	1½	...	1	Brim c			
46	6	...	4½	4	×	3½	3	...	2	1½ c	Brim				
47	1	...	6¼	6, 4½*	...	4	...	× 6¼, 3*	2¼	...	2½	c	1	...	Brim
48	3	...	7 ?	4½	×	3¼	2¾	...	2	c	1	Brim			
49	6	...	...	× 4½	...	3½	2 c	...	½	Brim					
50	2	...	7	×	3¾	...	3	2½	Brim	...	...	c			
51	1	...	7	...	6½	× 5	4¾	4½	c	3¾	...	...	...	Brim	
52	4	...	4½	...	3¾	3	...	2¾	c	Brim					
54	1	...	6	5½	× 4½	4½	...	3	...	...	2½	...	...	Brim	c
55	5	...	6½	5½	5½	× 5½	...	3	...	...	2¼	...	...	× c	
56	2	...	6½	+ 4	...	...	4	...	c	...	...	2	...	Brim	
57	4	...	4	...	×	...	2½	c	...	...	1	...	Brim		
58	2	...	6½	...	× 3½	...	c	...	3	...	2	...	Brim		
59	2	...	6½	4½	× 4	...	...	?	...	c					
60	2	7	7	×	5	...	...	3	...	...	...	Brim c			
61	4	...	7	×	5 c	...	4	3¼	...	...	Brim				
62	1	...	6	×	4½	...	3¼	...	c	...	Brim				
63	4	...	6	×	5	...	4	...	...	2 c	...	Brim			

× = hæmorrhage ceased. c = lochia ceased. * After catheter passed.

64	1	...	5¼	+	4	...	4	3½	o	2	...	...	...	Brim	
65	...	...	5½	...	5¼	...	...	...	4	×	...	...	o	Brim	
66	1	...	5	...	×4	...	3¼	...	o	1	...	Brim			
67	1	5½	×	5	5½	...	...	2½	...	o	Brim				
68	1	...	7½	×	...	...	o	4½	...	...	1				
69	2	...	6	...	×5	...	...	4	...	2	o	Brim			
70	1	6	...	...	4	×	2	...	...	Brim	o				
71	2	...	7	...	5	...	×	...	o	...	...	Brim			
72	6	...	6	...	5	×	...	3	o						
73	18	...	7	...	5	...	×	...	2½	...	Brim	o			
74	6	...	5	...	×3	...	...	2	o	...	...	Brim			
75	1	...	6	4	...	×3½	...	...	...	2½	...	Brim c			
76	4	...	? ×	...	3	o	...	...	Brim						
77	1	...	6¾	...	5	...	...	×	3	...	o	...	Brim		
78	?1	...	6½	×6	...	...	...	...	2	...	...	...	o	...	
79	1	...	8	...	4½	×	...	...	3	...	...	1	o		
80	1	...	9½	...	5½	×	...	...	2½	...	...	...	o		
81	1	5½	...	×4½	...	o	...	2	...	...	...	Brim			
82	1	...	5	×	?	3	2½ o	...	...	...	1	...	Brim		
83	3	...	6	×	...	...	3	...	...	...	...	...	...	...	c
84	5	...	6	...	×	...	5	...	2	...	...	...	Brim	o	
85	2	...	5	...	×	...	2	...	...	...	Brim o				
86	1	...	8	...	×6	...	o	...	3	...	...	Brim			
87	1	...	7	...	5½	...	×	...	1	...	Brim	o			
88	1	...	5½	4½	...	...	...	×3	...	o	...	...	Brim		
89	2	7	6	×	...	4	o	1	...	...	...	Brim			
90	2	...	6	...	×	3	...	...	o	Brim					
91	3	...	7	×	...	...	2½	o	?						
92	2	...	7	...	...	×4½	...	2½	o	2	...	...	Brim		
93	2	5½	...	4½	...	×	Brim	...	o	...	...	...	...	...	Ergot only after delivery.
94	1	...	6½	...	5½	...	×3	...	1	?	...	...	½ o	...	
95	1	6	5½	...	5	3½	...	2¾	...	1½	...	× o	Brim	...	
96	1	...	6	×5½	...	5	...	4	...	3	...	o	Brim	...	
97	2	6	...	...	4	×	2	...	1	o	...	Brim	...	...	

* After catheter passed.

Showing height of uterus above pubes in cases given.
Only a ʒj dose of Ergot after delivery.

Patient's number in book.	No. of children.	1st day.	2nd day.	3rd day.	4th day.	5th day.	6th day.	7th day.	8th day.	9th day.	10th day.	11th day.	12th day.	13th day.	14th day.
99	9	...	7½	...	× 6	...	5 c	...	...	3½	...	...	Brim	...	...
100	1	...	× 7	6½	...	5	...	c	3½	...	...	...	1	Brim	
101	3	...	6	×	5	...	c	3½	...	2	...	1			
102	2	...	5½	...	× 4	...	3	2	c	...	Brim				
103	2	...	6½	...	× 4½	...	...	3	c	...	1	Brim			
104	? 1	...	7	...	× 5	...	...	3½	3 c	...	2				
105	1	...	7½	...	× 5	...	2½	c	...	...	...	...	Brim		
106	2	...	6½	5½	×	...	2¾	...	c	1					
107	2	...	7	×	5	c	...	...	...	...	...	Brim			
108	1	...	7	× 5	3¾	...	...	1 c	Brim						
109	2	...	7	5	×	4	c	...	1½	1	1½	...	Brim		
110	1	...	6½	×	5½	5	3	...	3 c						
111	2	...	6	...	4½	×	...	3	2½	...	1	...	c		
112	6	...	8	...	5½	×	...	4½	3	...	...	...	Brim	...	c
113	5	...	6	5½	...	×	4½	...	3	...	...	...	Brim	...	c
114	2	...	6½	...	×	5	...	4	...	...	c	...	1		
115	2	...	7½	7	...	6	×	...	...	...	1 c	...	Brim		
116	1	...	7	...	×	...	...	4	...	2	c	...	...	...	Brim
117	1	...	4½	4½	×	...	...	4	...	3¾	...	...	Brim	c	
118	2	...	...	×	4	...	...	2½	...	c	1½	1	Brim		
119	5	...	...	× 3¾	...	4	...	...	...	2 c	2	1			
120	2	...	5	...	...	× 4	4 c	...	...	3	...	1	...	Brim	
121	1	...	4	...	...	×	3	...	3	...	1½	...	...	c	
122	8	...	4	...	3½	...	4½	×	...	3	...	Brim	...	c	
123	7	...	6	× 3	2¾	...	...	...	½	Brim	...	...	c		
124	1	5	5	×	4½	4	...	2	...	...	...	...	1 c		
125	1	4¾	6¾	× 6½	5	...	...	2½	2	...	...	1 c			
126	1	...	× 7	4	3½	...	...	2	c	...	...	1	...	Brim	
127	10	...	6	4	×	3	...	...	...	...	1 c				
128	3	...	7	6	×	4	c	3	...	...	1				
129	3	..	4	3½	×	...	3	...	...	...	2 c	...	...	Brim	
130	1	...	6	5½	...	× 5	4	...	3½	...	3	...	Brim c		
131	1	...	7	...	...	× 4	...	...	...	2 c					

132	1	...	6½	...	...	× 5	...	...	At umbil. bladder above pubes	...	2 o	...	Brim		
133	2	...	7	6	×	4	4	...	2	o					
134	3	...	7	6	5	×	4	...	...	1	Brim o				
135	2	...	6	5	...	×	3	...	2	...	1 o				
136	1	...	10, 5½*	×	...	4	...	3	...	2½	...	1½	...	Brim o	
137	3	...	7	...	× 5	...	4	o	3	1	...	...	...	½	Brim
138	2	...	6	...	4	...	× 3½	...	3	...	1	...	Brim	o	
139	3	...	6½	× 5½	...	4	...	5	o	...	2	...	1½		
140	2	...	6	...	× 5	...	2½	...	1½	...	o	...	Brim		
142	3	...	6½	6	...	6	5	× 4	...	...	2½	o	...		Brim
143	1	...	Umbil. level	..	4	...	× 3	...	...	1½	...	...	...	Brim	o
144	1	...	6½	....	6	×	4½	...	...	3	...	2	?	Brim	o
145	1	...	...	5½	×	...	4	3	...	2½	...	...	o	Brim	
146	3	...	6	5	×	...	4½	...	...	3	...	o	1	1	
147	1	...	5	× 4½	...	...	...	...	1½	...	o	...	Brim		
148	3	...	7	...	× 4½	...	3½	o	2	...	1				
149	2	...	5	...	× 3	...	2½	o	...	1					
150	9	7	...	4	×	...	3	...	...	...	...	o	1		
151	2	...	5½	...	× 5	...	...	...	3½	...	...	2 o			
152	5	5½	...	× 5	...	...	3½	...	...	...	o	...	Brim		
153	2	8	...	×	...	3½	...	2	...	o	...	2	...	1	
154	2	....	× 5½	....	3½	...	...	... :	3 o	....	2	....	...	Brim	
155	5	6	...	× 5	...	...	4	...	o	...	...	...	...	Brim	
156	12	6½	...	4½	×	4	...	...	...	o	...	...	1	...	Brim
157	7	6½	...	...	4½	...	×	3	...	...	...	...	o	Brim	
158	1	...	7	5½	...	...	4	...	×	...	...	...	Brim	o	
159	2	...	6	4	×	...	3	...	...	1½ o	...	...	Brim		
160	1	...	6½	5½	...	×	...	...	...	o	...	...	1	½	
161	6	...	5½	...	5	×	...	...	...	4 o	...	2	...	Brim	
162	2	...	7	5	4½	×	...	3½	...	o	1	...	...	Brim	
163	2	...	...	× 5½	...	...	3½	...	2½	2½ o	...	1½	1		

* Bladder 3 inches above pubes.

TABLE II.

Day.	Height in inches above pubes. Average. Ergot after delivery only.	Ergot daily.
2	6·19	6·43
3	5·09	4·79
4	4·40	4·54
5	4·15	3·82
6	3·55	3·13
7	3·08	2·86
8	2·21	2·13
9	2·04	1·21
10	1·21	·84
11	1·13	·38
12	·35	·09
—	·18	—

TABLE III.—*Showing the day on which the Fundus Uteri had sunk to the Pelvic Brim.*

Day.	Ergot after delivery only.	Ergot daily.
1	—	—
2	—	—
3	—	—
4	—	—
5	—	—
6	1	—
7	—	—
8	1	2
9	1	4
10	2	8
11	4	16
12	18	10
13	13	7
14	4	1

TABLE IV.

Day of lying-in.	Cases with one dose only of ergot. Hæmorrhage ceased.	Lochia ceased.	Ergot throughout. Hæmorrhage ceased.	Lochia ceased.
2 ...	3 ...	— ...	2 ...	—
3 ...	17 ...	— ...	19 ...	—
4 ...	24 ...	— ...	19 ...	1
5 ...	16 ...	1 ...	8 ...	2
6 ...	5 ...	5 ...	4 ...	8
7 ...	2 ...	6 ...	4 ...	3
8	1 ...	10 ...	1 ...	11
9 ...	— ...	12 ...	1 ...	6
10 ...	— ...	11 ...	— ...	4
11 ...	— ...	6 ...	— ...	8
12 ...	— ...	7 ...	— ...	5
13 ...	— ...	5 ...	— ...	4
14 ...	— ...	4 ...	— ...	4
Average day .	4·19 ...	9·5 ...	4·25 ...	9·4

It will be seen that the difference in this respect is quite trifling.

Dr. BOXALL contrasted two series of cases, each referring to 100 patients. Every alternate patient admitted to hospital was given a mixture containing Tinct. Ergot. Amm. ℥xv, Sp. Chlorof. ℥xv, Aq. Camph. ad. ℥j three times a day, during the first three days of the lying-in. With a view to avoid fallacy in the comparison, the two series of observations were carried on simultaneously. The ergot mixture was given in the first series. In the second its routine administration was omitted, but in this series are included thirty-one patients for whom, on account of hæmorrhage, severe after-pains, &c., ergot was subsequently prescribed. The results of these observations are presented in a tabular form below. By contrasting the two series of cases, Dr. Boxall concludes (1) that though the routine administration of ergot during the first three days of the puerperium exercises no appreciable effect on the date at which the lochia cease (in this respect confirming the observations of the authors of the paper), the practice of giving an ergot mixture during the three days immediately following delivery tends to prevent the formation of clots, to hasten their expulsion, and to diminish the frequency, intensity, and duration of after-pains; (2) that, if omitted at first but given subsequently, the ergot mixture tends to promote the expulsion of clots, and to relieve after-pains. Dr. Boxall

also drew attention to the following important consideration, that (*a*) the routine practice (which he had followed) of administering the douche at 110°—115° F. (a powerful stimulant to the uterus) not only immediately after labour, but also twice a day during the puerperium until the lochia cease, (*b*) the ergot which was given immediately after labour in every case, and (*c*) the ergot mixture which was prescribed subsequently in thirty-one of the cases included under the second series, all tend to minimise the difference which he had shown to exist between the two, and that in consequence the beneficial effect of the ergot mixture is even greater than that shown by the figures given in the tables.

SERIES I. (100 patients placed upon ergot during first three days of puerperium.)	SERIES II. (100 patients *not* placed upon ergot as a routine measure, including 31 to whom ergot was subsequently given for special reasons.)
Average day of puerperium on which lochia ceased, 9·97.	Average day of puerperium on which lochia ceased, 9·64.
Complained of after-pains—	Complained of after-pains—
Severe ..... 24 = 24%	Severe ..... 48 = 48%
Slight..... 33 = 33%	Slight ..... 26 = 26%
57 = 57%	74 = 74%
Passed clots... 38 = 38%	Passed clots... 39 = 39%

TABLE I.—*Showing effect of ergot given during puerperium.*

TABLE II.—*Showing days of puerperium on which complaint was made of after-pains.*

	After-pains.					After-pains.				
Day.	Severe.		Slight.			Day.	Severe.		Slight.		
i.	11	+	12	=	23	i.	24	+	11	=	35
ii.	19	+	21	=	40	ii.	47	+	21	=	68
iii.	8	+	8	=	16	iii.	31	+	10	=	41
iv.	3	+	None	=	3	iv.	10	+	None	=	10
v.	None	+	None	=	None	v.	2	+	1	=	3
vi.	None	+	None	=	None	vi.	1	+	1	=	2
Total ...	41	+	41	=	82	Total...	115	+	44	=	159
Average day of puerperium on which after-pains ceased.	1·82						2·70				

TABLE III.—*Showing relation of clots to after-pains.*

Among * * patients	* * passed clots.	Among * * patients	* * passed clots.
(1) Who had after-pains—		(1) Who had after-pains—	
Severe 24	13 = 54·1%	Severe 48	24 = 50%
Slight 33	12 = 36·3%	Slight 26	10 = 38·4%
57	25 = 43·8%	74	34 = 45·9%
(2) Who had *no* after-pains 43	13 = 30·2%	(2) Who had *no* after-pains 26	5 = 19·2%

TABLE IV.—*Showing days of puerperium on which clots were passed.*

Day.	By * * patients.	Day.	By * * patients.
i.	9	i.	3
ii.	21	ii.	19
iii.	25	iii.	14
iv.	11	iv.	9
v.	4	v.	7
vi.	4	vi.	2
After vi.	None.	vii.	2
		viii.	None.
		ix.	None.
		x.	1
		After x.	2
Average day of puerperium on which clots ceased to be passed.			
3·36		3·82	

Dr. DAKIN said he had made observations on the effect of the systematic administration of ergot for some days during the puerperium. He obtained his figures, which he would read, from his own measurements of cases in the General Lying-in Hospital made while he was house physician. They did not support the view the authors took, but were as follows:

	Height in inches above pubes.	
Day.	Average ergot after delivery only.	Ergot daily (for three days) *i. e.* 2nd, 3rd, and 4th.
ii	5·8	6·36
iii	4·5	5·43
iv	4·25	4·60
v	3·70	4·33
vi	3·40	4

and so on for all the days following. He drew attention to the fact that these averages after the sixth day, in which the first of the authors' cases went below the brim in the first column (see authors' Table III) were not averages of the whole, but of those cases remaining above a certain arbitrary line, and therefore practically selected cases, thus somewhat vitiating the comparison. Comparing his figures with those of Table III, he found in adding up the figures in that table, that the average day on which the fundus had sunk to the brim in the first column (ergot only once) was the 12th, in the second column (ergot daily) 11·08. His figures were 9·12 (ergot only once), and 10·3 (ergot daily for three days), the ergot cases being thus behind again. He thought that the fallacies enumerated by the authors were too important to allow of comparisons being made between any two series of cases, but in addition to those mentioned, namely, condition of bladder, of rectum, thickness of abdominal walls, and actual height of uterus in pelvis, there was the condition of the uterine axis, whether flexed or inclined or both—antero-posteriorly or laterally. He found in a number of consecutive cases taken at random that one sixth of the uteri were

in the axis of the body. These ought not to be compared with cases in which the conditions usual to the uterus during the puerperium, namely, anteflexion and -version, were present, or there might be a difference of three or more inches on this account alone. Also the uterus was occasionally found much lateriflexed. For instance, in one of Dr. Dakin's cases the fundus was found one day in the left hypochondriac region, and nine inches from the pubes, whereas in the next it was to the right of the middle line, and only measured five and a half inches. In Case 47 in Table I, on the third and seventh day, it was seen what difference a full bladder would make, and if this one marked case occurred, there were probably many others of less degree which passed unnoticed. He quite agreed with Dr. Boxall that the lochia were a better criterion of the rate of involution. Here there was very little difference in the authors' two columns, but it was in favour of continuous administration. His own figures were in opposite relation, viz. with one dose only the average day for the lochia to cease was the 9·8th; with three days' ergot it was the 11·6th day. He found with reference to the retention of clots and the occurrence of after-pains the following:—Out of 92 cases where ergot was given for three days, 51 = 55·4 per cent. had after-pains, and 22 = 23·9 per cent. passed clots. Out of 103 cases where only one dose of ergot was given, 64 = 62·136 per cent. had after-pains, and 14 = 13·592 per cent. passed clots. So that the ergot cases had the advantage of having fewer after-pains, but passed a larger number of clots. In the unergotised cases, like Dr. Boxall's, the clots went on being passed up to the tenth day or later, whereas in those which had ergot for three days the last clot was passed on the sixth day. It seemed to him that the continuous use of a drug which kept the uterus in a tonic state of contraction, instead of allowing the alternate contraction and relaxation which goes on normally, would tend to favour the retention of clots, and also to some extent prevent, by constantly irritating and stimulating the uterus, the normal process of involution. This *primâ facie* opinion was to a great extent borne out by his figures.

Dr. SWAYNE wished to know in how many of the cases just mentioned chloroform was given during delivery. In order to ascertain accurately the effects of ergot given after delivery, it was, in his opinion, necessary to remove all disturbing influences, such as the administration of anæsthetics, especially to any extent, during labour.

Dr. HERMAN said that as the cases observed by Dr. Dakin (which seemed to support an opposite conclusion to that arrived at by Dr. Fowler and himself) were only given ergot for three days, while those on which the paper was based took it for a fortnight, he (Dr. Herman) did not regard the two sets of cases as strictly comparable, and therefore did not think Dr. Dakin's

cases refuted the conclusions in the paper. The sources of error arising from the mode of measurement, which Dr. Dakin had pointed out, had been present to the minds of Dr. Fowler and himself. But there was no other mode of measurement which was not attended with sources of fallacy quite as great. They had stated in the paper the precautions taken to secure that the bladder should be empty when the measurements were taken. In the cases in the table in which the measurement was given before and after passage of the catheter, the latter was the one used in computing the average. Such errors as arose from anteversion and anteflexion of the uterus were equally distributed among the two sets of cases, and so did not vitiate the comparison. Dr. Fowler and he had paid considerable attention to the occurrence of lateral displacement of the uterus in the early days of the lying-in, and had found that at least in the large majority of cases, it was produced by the patient lying for some time on one side, the uterus then falling to the side on which the patient lay. They had not referred to this in the paper, because it did not seem to them to have any important bearing on the subject of the paper. In reply to a question from Dr. Swayne, chloroform had been given in six cases, Nos. 65, 83, 84, 124, 126, and 142: three in each series.

Annual Meeting.

The audited balance-sheet of the Treasurer, Dr. Galabin, was read.

It was proposed by Dr. Routh, seconded by Dr. Rogers, and carried *nem. con.*, "That the audited report of the Treasurer, just read, be received, adopted, and printed in the next volume of the 'Transactions.'"

Dr. Rogers said he had much pleasure in seconding the resolution placed in his hand. He cordially concurred in the observations made by the mover, Dr. Routh, and felt that the Society deserved to be congratulated for the manner in which its finances were managed; it was evidently in a flourishing condition. He therefore begged to second the resolution, "That the audited report of the Treasurer, just read, be received, adopted, and printed in the next volume of the 'Transactions.'"

The report of the Honorary Librarian (Mr. Alban Doran) was then read.

Report of the Honorary Librarian for 1887.

"In presenting this report, I am able to testify with confidence that the usefulness of our valuable Library continues to be recognised and appreciated by the Fellows of the Society. No Library is more devoted to purposes of study than our own. Diligent workers frequently resort to it in order to consult costly standard publications, whilst others constantly avail themselves of the privilege of borrowing monographs and text-books.

"The additions made to the Library in 1887 include 32 books and 40 pamphlets received as donations, and 74 books and 12 pamphlets which were purchased; to these must be added 61 periodicals. The 52 pamphlets having been bound together so as to form 3 volumes, the total of

BALANCE-SHEET OF THE OBSTETRICAL SOCIETY OF LONDON.

(Abstract of the Receipts and Expenditure for the year ending December 31st, 1887.)

1887. RECEIPTS.	£	s.	d.
To balance from 1886	353	4	0
(1) 679 ANNUAL SUBSCRIPTIONS at £1 1s., realising	712	19	10
(2) 6 COMPOSITION FEES at £10 10s.	63	0	0
(3) MIDWIVES' EXAMINATION FEES	108	11	0
(4) SALE OF 'TRANSACTIONS' and 'RULES FOR INFANT MANAGEMENT' (Longmans) £60 8 6			
Do. do. (Society) 16 2 9			
Do. Duplicate Books 0 2 0	76	13	3
(5) INTEREST on Consols	42	2	11
Amount of Stock, 3 per Cent. Consols, standing in the names of the Trustees £1700 0 0			
	£1356	11	0

1887. EXPENDITURE.	£	s.	d.
By (1) 'TRANSACTIONS,' VOL. XXVIII, Printing, Lithography, Paper, Binding, Index, and delivery of Volume	228	7	7
(2) LIBRARY:			
Books Purchased and Binding	61	6	0
(3) MUSEUM AND LIBRARY:			
Rent £100 0 0			
Librarian, Salary and Commission 172 11 7			
Library Fittings, Repairs to Furniture, Cleaning, Coals, Gas, &c. 57 16 4			
Petty Disbursements 2 6 0	332	13	11
(4) GENERAL MEETINGS AND OTHER EXPENSES:			
Contribution for use of Meeting-room £46 4 0			
Expenses of Meetings 43 11 2			
Stationery and Postage 47 9 2	137	4	4
(5) EXAMINATION OF MIDWIVES:			
Expenses of	5	10	7
(6) BANKING EXPENSES:			
Commission, Stamps, Postages, &c.	0	6	11
PURCHASE OF CONSOLS, £200	203	10	0
Balance at Bank	387	11	8
	£1356	11	0

Audited and found correct,

(Signed) F. H. CHAMPNEYS, *Hon. Sec.*
W. F. CLEVELAND.
MONTAGU HANDFIELD-JONES.
ROBERT BOXALL.
W. R. DAKIN.

additions will be 109, or, including the additional volumes of periodicals, 170. As the Library consisted at the end of 1886 of 3690 volumes, the additions during 1887 increase the collection to 3860 volumes.

"During the past year, several series of important foreign periodicals, hitherto incomplete on our shelves, have been completed by purchase, and the Society has acquired some valuable standard works and atlases of plates, mostly out of print, including Boivin and Dugès' 'Anatomie Pathologique de l'Utérus,' and August Förster's 'Missbildungen des Menschen.' The Society has also procured for the Library those volumes of the catalogues of pathological collections in the Museums of the Royal College of Surgeons, and of metropolitan medical schools, which include descriptions of series illustrating injuries and diseases of the female organs of generation.

"According to a resolution announced in the report for 1886, a small room adjacent to the Library has been filled up with shelves for books.

"ALBAN DORAN."

It was moved by Dr. HERMAN, seconded by Dr. GIBBINGS, and carried, "That the report of the Honorary Librarian be received, adopted, and printed in the 'Transactions.'"

The report of the Chairman of the Board for the Examination of Midwives (Dr. Black) was then read.

Its reception and vote of thanks were moved by Dr. GALABIN, seconded by Mr. MEREDITH, and carried unanimously.

Report of the Chairman of the Board for the Examination of Midwives.

"During the last year 125 women were examined by the Board. Of these 96 passed and 29 were rejected, giving a percentage of 23·2 rejections, or about 1 in 4⅓.

"The number of candidates for the diploma of the Society is steadily increasing. Thus, there were 63 in

the year 1884, 82 in 1885, 102 in 1886, and 125 in 1887; while in the fifteen years from 1872, when these examinations were instituted to 1886 inclusive, there were in all 473, or less than four times the number who came forward in the single year 1887.

"J. WATT BLACK,
Chairman."

The Scrutineers of the ballot having presented their report, the President announced the result.

President.—John Williams, M.D.

Vice-Presidents.—Francis Henry Champneys, M.A., M.B.; William Frederick Cleveland, M.D.; Robert Cory, M.D.; Charles James Cullingworth, M.D. (Manchester); William Stephenson, M.D. (Aberdeen); J. Knowsley Thornton, M.B., C.M.

Treasurer.—Alfred Lewis Galabin, M.A., M.D.

Chairman of the Board for the Examination of Midwives.—James Watt Black, M.D.

Honorary Secretaries.—Percy Boulton, M.D.; Alban Doran.

Honorary Librarian.—Peter Horrocks, M.D.

Other Members of Council.—Robert Boxall, M.D.; J. Matthews Duncan, M.D., F.R.S.; William Duncan, M.D.; Alfred Thomas Gibbings, M.D.; Walter S. A. Griffith, M.B.; Frederick B. Hallowes (Redhill); Edwin Hollings, M.D.; Jamieson Boyd Hurry, M.D. (Reading); Evan Jones (Aberdare); Montagu Handfield-Jones, M.D.; A. E. Aust Lawrence, M.D. (Clifton); Arthur H. N. Lewers, M.D.; George Lowe (Burton-on-Trent); Oliver Calley Maurice, M.D. (Reading); William Appleton Meredith, M.B., C.M.; John Phillips, B.A., M.B.; Arthur Roper; Amand J. Mc C. Routh, M.D.

The PRESIDENT then delivered the Annual Address, after which a vote of thanks was moved by Dr. BRAXTON HICKS, seconded by Dr. SWAYNE, and carried by acclamation.

ANNUAL ADDRESS.

GENTLEMEN,—The Society presented an humble address to the Queen on the completion of the fiftieth year of Her Majesty's reign, to which a gracious reply was received through the Home Secretary.

In summing up the work of the Society during the year 1887, I have to refer not only to the activity which has been displayed by the Fellows of the Society in the scientific contributions which have been brought before us, but I have also to notice the work of one whose hand never tires, whose activity never ceases, and whose contributions demand notice in every annual address. The hand of death has removed from our ranks eleven of our Fellows. Some of these have been taken from us at the dawn of professional life, before they had yet emerged from their Alma Mater to engage in the struggle which the day brings with it; others at noon-day in the prime of life, and while actively engaged in its duties; others again when the heat and struggle had passed, and the sun was waning, died full of years, full of honours, having attained to the highest rung of the professional ladder, and enjoyed the confidence of the profession and the public. Of several of our fallen Fellows, I can but reverently record the names.

John Dickenson, F.R.C.S., Honorary Surgeon to the Wrexham Infirmary, was elected a Fellow of the Society in 1866.

Alexander Towne, M.R.C.S., was elected in 1870, and died at the age of forty-seven.

Robert Schackleford Cross, M.R.C.S., of Petersfield, was elected in 1869.

William Henry Thornton, M.R.C.S., who was elected in 1867, died at Hastings in March at the age of sixty-five years. He was born at Uxbridge in 1822, and received his medical education at Charing Cross Hospital. He settled at Margate, and practised there for forty-two years. He was Surgeon to the Sea-Bathing Infirmary, and to the Asylum for the Deaf and Dumb. He was also a Justice of the Peace. Of him a writer in the 'Lancet' states: "He was an honour to his profession, upheld its dignity, and was loyal in his dealings with his professional brethren . . . . . He was full of charity, and one of those which thinketh no evil."

F. A. T. O'Meara, L.R.C.P. and M.R.C.S., perished in the wreck of the steamer which foundered on the rocks near Dieppe in the spring.

He was a distinguished student of King's College, where he entered in 1881. He had held the post of Resident Accoucheur at King's College Hospital, and at the time he met with his death was on his way to Paris, where he intended to spend a short holiday, previous to entering upon his duties as house surgeon to Sir Joseph Lister.

He was elected a Fellow of the Society in 1886, and at the February meeting of last year he showed an interesting specimen of dilated and hypertrophied bladder in a fœtus.

James Troutbeck, M.D., died of acute pneumonia on May 17th, at the age of forty-one. He was born in Cumberland, and was educated in the Appleby Grammar School. From there he went to Edinburgh, where he graduated M.D. He settled at Bushey, Herts, whence he removed to Finsbury Park a short time before his death.

John Henry Wilson, M.K.Q.C.P.I., died on June 21st, at the aged of sixty-five years. He was born at Lymm, Cheshire, and educated at Trinity College Dublin, where he was Surgical Prizeman in 1851. He was elected a Fellow of the Society in 1873. He was for many years Physician, and afterwards Consulting Accoucheur to the

Ladies' Charity and Lying-in Hospital, Liverpool. He had been in failing health for some time, and about three weeks before his death he stumbled and fractured his leg, an accident which appears to have accelerated his end.

Gustavus Charles Philip Murray was the youngest son of the Hon. Edward Murray, Marshal of Trinidad. He was born in that island in 1831. As a boy he was delicate, and was educated in private schools in England, and by reason of his delicate health was obliged to revisit the West Indies more than once.

He entered King's College as a Student of Medicine when Todd, Bowman, Ferguson, and Farre were on the Staff of that Medical School. In 1856 he became a Member of the Royal College of Surgeons. After he had completed his studies at King's College he continued them in Vienna, and in 1860 graduated in the University of Edinburgh. Circumstances did not lead him to the pursuit of obstetric medicine, but he seems to have selected this at an early period as the department of the profession to the cultivation of which he would devote his life. He settled in Green Street, and soon obtained some of the lesser appointments which fall to the lot of young obstretricians. He was for several years Obstetric Physician to the St. George's and St. James's Dispensary, then to the St. Pancras Dispensary, and subsequently to the Great Northern Hospital, and the Establishment for Gentlewomen in Harley Street. The two last he continued to serve until his death.

He was an original Fellow of this Society, and held office in it from 1864 to 1877. He performed the laborious duties of Secretary for the four years 1866–69, for the last three of which he had Dr. Gervis for his colleague. He was Treasurer for the five years 1873–77. Three years ago he was asked by the Council to allow himself to be nominated for the highest office in the Society, but he declined by reason of failing health.

Dr. Murray was not a voluminous writer, but he contributed several articles on obstetric subjects to the

Journals, and in the 'Obstetrical Transactions' will be found several short papers from his pen. Until two years ago he was a regular attendant, and not an infrequent speaker at our meetings. His remarks were always short, pithy, and to the point. He possessed a keen sense of humour, and had the happy gift of seeing the weak point of an argument, and by a simple question would cause the collapse of a superstructure built on unsound foundations.

He was of a kind and genial nature; his conversation was lively and humorous. This made him many friends when a student at King's College and in after-life, who remained his friends until his death. He enjoyed a considerable practice, and devoted himself, regardless of himself, to the interests of his patients. In return he was trusted and loved. Many of them feel that they have lost in him not a physician only, but also a friend.

In 1881 he suffered from an attack of pneumonia, after which he never seems to have regained his strength and vigour. Latterly he had become much broken, and he died suddenly of failure of the heart on August 7th, at the ege of fifty-six years, at his residence in Great Cumberland Place.

Joseph Randle Buck, L.R.C.P., M.R.C.S., and L.M., was born in Dudley and died at Sudbury, Worcester. He practised for some time at Alcester, and then removed to Worcester. He was Surgeon to the B Company of 2nd Battalion Worcestershire Volunteers, a Lecturer for the St. John's Ambulance Association, a Town Councillor, and an active Freemason. In the latter body he appears to have held high rank. He was elected a Fellow of the Society in 1870.

For the following notice of Mr. Samuel Berry I am indebted to Dr. Bassett, his successor in the Chair of Midwifery at the Queen's College, Birmingham.

Samuel Berry, F.R.C.S., was a native of Birmingham, and resided in that town until he retired from practice in

1882, when he removed to Clapham, where he lived until his death on September 29th, 1887.

Mr. Berry was descended from a long-lived race of Puritan ancestors, whose portraits adorning his dining-room walls he was always proud to point out to his guests. In his early professional life Mr. Berry was known as a quiet, unobtrusive, hardworking general practitioner.

The death of Dr. Ingleby in 1845, and the removal of two other medical men who had enjoyed much public favour, opened the way for Mr. Berry, then in the prime of life and furnished with ample knowledge and experience, to rise rapidly and take a leading position in obstetric practice. He succeeded Dr. Ingleby in the Chair of Midwifery Queen's College, discharging the duties of the appointment for twenty years, during which time he was also Consulting Accoucheur to the Lying-in Department of the Queen's Hospital.

Mr. Berry's contributions to obstetric literature were not numerous. One remarkable case fell under his notice, viz. of sudden death after delivery, which appeared on post-mortem examination to have arisen from air entering the uterine sinuses and thus reaching the right side of the heart.

Mr. Berry was a man whom prosperity did not spoil; he never lost the simplicity of manner and kindness of heart which endeared him to his friends and patients whilst it won the respect of his professional colleagues and contemporaries. He was a deeply religious man, open-handed to the poor, anxious and willing to do all in his power to relieve suffering in any shape, considerate and lenient in his judgment of others, silent when he could not conscientiously give a word of praise. Mr. Berry remained in fair health until within three days of his death, resulting from apoplexy, in his eighty-second year.

He was an original Fellow of the Society, and contributed to the 'Transactions' a paper on obstructed labour.

For the account of our late Honorary President, Dr. Arthur Farre, I am indebted to Dr. Priestley, who wrote the obituary notice of him which appeared in the 'Lancet,' and from which I shall quote freely.

Dr. Farre died at his house, 18, Albert Mansions, on December 17th, at the age of seventy-seven. He came from a long-lived family. His father died in 1862 at the age of eighty-eight years, and his brother in 1886 at the age of eighty-four years. He came also of a family of doctors. His grandfather was a medical man in the Island of Barbados, where he possessed an estate. His father was Dr. John Richard Farre, who lived in the Charterhouse, and who, I believe, took an active part in founding the Royal London Ophthalmic Hospital, and wrote on the diseases of the heart and liver. Arthur Farre was one of eleven children, four of whom were educated for the medical profession. Two of them gave up the pursuit of medicine. The third was Frederick John Farre, once Physician to the St. Bartholomew's Hospital, and Lecturer on Materia Medica at the Medical School, and Treasurer of the Royal College of Physicians. The fourth was the subject of the present notice.

Dr. Arthur Farre was born in London on March 16th, 1811. He received his early education at the Charterhouse School, and in 1827 he became a pupil of the Royal London Ophthalmic Hospital, and a student of St. Bartholomew's Hospital. Caius College, Cambridge, has been the Alma Mater of many distinguished members of our profession, and in 1828 Farre entered that College, at the same time carrying on his studies at St. Bartholomew's. He was prosector to Mr. Abernethy, and prepared the subjects for his last course of lectures.

He graduated M.B. at Cambridge in 1833 and came out first. He proceeded M.D. in 1843. After having completed his studies at Caius and St. Bartholomew's he does not seem to have devoted himself at once to obstetrics, which subsequently became the subject of his lifework. At first he studied comparative anatomy, and

succeeded Professor Owen in 1836 as lecturer on that subject at St. Bartholomew's. In 1838 he was lecturing on Forensic Medicine, and it is about this time he seems to have turned his attention to midwifery, and in 1841 he was elected Professor of Midwifery at King's College in succession to Robert Ferguson. He held this Chair until 1862, and on his resignation was appointed Consulting Physician to the hospital and Emeritus Professor in the college. Dr. Farre became a Member of the Royal College of Physicians in 1838, was elected Fellow 1843, and he held the offices of Councillor, Censor, and Examiner in that college. He was also Examiner in Midwifery for the Royal College of Surgeons for twenty-four years. This post he resigned in 1875, together with his fellow-examiners, Dr. Priestley and Dr. Barnes, as a protest against the admission of imperfectly qualified persons to the right of being placed on the Medical Register. Their action was successful for, when the vacancies were advertised suitable successors were not found.

Dr. Farre was elected a Fellow of the Royal Society at the early age of twenty-eight, and served afterwards on the Council and as referee of papers. He was an accomplished microscopist, and took an active part in founding the Royal Microscopical Society, gave material help in obtaining for it a Royal Charter, acted as its first Honorary Secretary, and afterwards as its President, and contributed several papers to its 'Transactions.' Dr. Farre's chief work, and the one by which he will be best known is the article, "Uterus and its Appendages," published in 1868 in Todd and Bowman's 'Cyclopædia of Anatomy and Physiology.' This article bears the impress of Dr. Farre's wide scientific culture, contains evidence of original research, and forms the best compendium of our knowledge of the anatomy, physiology, and pathology of the uterus at the time it was published.

At an early age Dr. Farre was appointed to the Chair of Midwifery at King's College, and his scientific training and personal qualities soon brought him into prominence,

and ultimately he became the leading obstetric physician in London. He was appointed in 1864 Physician Accoucheur to H.R.H. the Princess of Wales, and subsequently to H.I.H. the Duchess of Edinburgh, and in 1875 he was appointed Physician Extraordinary to the Queen.

About this time Dr. Farre met with a serious accident, which necessitated his retirement from active practice.

Of his personal and social character Dr. Priestley, who knew him well, writes, "At the time of his death he had been so long out of practice that he came to be regarded by the world as a physician of a past generation, and so many of his more intimate friends had dropped off or were invalided that he seemed in a sense isolated, if not lonely. Those of his more intimate acquaintances, however, who had known him in earlier days, and who cherished a personal regard for him, paid him occasional visits and were warmly welcomed.

"Dr. Farre was habitually courteous in manner both in his relations to his patients and in his consultations with his *confrères*. He was a gentleman in the best sense of the word, considerate of the feelings of others, and never inflicting pain, as do some honest people, who speak their minds too freely, though with the best intentions. If his manner was by some regarded as formal, it was but the outcome of a cultivated precision in thinking and speaking, and because he was thoroughly imbued with the dignity of his calling, and not from any sense of his personal importance. He was punctilious in the arrangement of his work, and constantly punctual in the keeping of his appointments. Being an earnest worker himself he proved himself an earnest and impressive teacher, and when at length he ceased to teach, and was placed on the governing body of King's College, he was most conscientious in the exercise of his patronage and in his desire to do his best for the institution.

"On retiring from practice he presented his valuable collection of obstetric and other books to the Royal College of Physicians, where they form a separate section with his

name attached. At the same time he bestowed on the Obstetrical Society a valuable series of pelves and gynæcological casts, which form a distinct feature in its museum.

"The social side of Dr. Farre's character should not be lost sight of in writing a memorial of him. He was a regular attendant at the St. Alban's dinners and was very proud of his admission to the very exclusive College Club. He had a great love for music, and being a good musician himself, and having a good voice, he often charmed his friends at their houses and his own, either by playing or joining in some part-song."

He was buried at Kensal Green on December 22nd, where the Obstetrical Society was represented by the President and senior Secretary.

Twenty-eight Fellows have resigned, and 8 have been removed from the list by erasure, making a total loss of 47 by death, resignation, and erasure.

Although we lament the loss of honoured and valued colleagues, some of whom have worked in this Society from its foundation, yet we at the same time rejoice at the accession of a large number of new Fellows into our ranks, some of whom we cannot help believing will prove acquisitions of strength to the Society. Sixty-two new Fellows have been added to our roll during the year, thus making the total number 741, or 15 more than on January 1st, 1887.

126 candidates presented themselves for the examination for the Diploma of the Society in Midwifery. Of these 96 satisfied the Examiners, thus raising the number of women who have received the Society's certificate to 491.

Our invested funds have been increased, and our balance at the bank is larger than it was at the beginning of the year.

The main source of our wealth and of our power consists, however, not in our invested funds and our balance at our bankers. These are indeed sources of wealth and power to us, for without them we could not publish and disseminate the valuable work which is done in this room

month by month. Yet worldly wealth would be a burden to a Society such as ours, but for the outlet we have for it in the publication of the 'Transactions.' As a Society we have no great interests, political or personal, to serve; we have no cellars or dining halls; we have no luxuries in the shape of criminals or beggars to maintain; our main object is the increase and spread of scientific knowledge in obstetric medicine. The other interests we may have are minor and subsidiary. On this subject we spend our money and our strength, and our greatest wealth consists in the work which is brought to us from month to month and from year to year. It has been coming in faster and faster, and we have had to hold, for the first time in the history of the Society, an extra meeting to utilise it. It continues to come in, and upon that which we acquired during the past year I have now to make some observations.

The specimens exhibited in the course of the year have, for the most part, been illustrative of the diseases of the ovum, and the pathology and practice of the diseases of women and midwifery. Those illustrating the diseases of the ovum are, "Notes of a Case of Dilatation and Hypertrophy of the Bladder in the Fœtus," by Mr. O'Meara; the heart and large vessels of a dicephalous fœtus, with a drawing, by Dr. Phillips; a large tumour at the end of the spine, by Dr. Horrocks; spinal meningocele with a dissection, by Dr. Phillips; retroflexion of an early human embryo with absence of the spinal medulla and imperfection of the vertebral column, with microscopic sections and illustrations by Mr. Lockwood; microscopic sections of a tumour of the fœtal membranes by Drs. Herman and Bluett.

The diseases of the ovum is a subject to which but little attention has been directed in this Society, and indeed its study is as yet but just begun. There is no subject in which work would prove productive of a richer harvest than this, where the material is so abundant, and the field so large as it is in London.

Of specimens illustrative of the diseases of women, I find that four instances of that somewhat rare disease, fibroid tumour of the ovary, have been exhibited in the course of the year. It is not so long since the existence of this affection was called in question. With one exception the nature of these specimens was proved by microscopic examination.

Dr. Handfield-Jones showed a double-bodied uterus and Mr. Doran a malformed Fallopian tube; Dr. Griffith showed an interesting specimen of anterior and posterior parametritis, one of hæmatometa and hæmatosalpinx, and of pyometra; Mr. Tait showed some diseased tubes.

Dr. Galabin showed a uterus with the placenta *in situ*, removed by Porro's operation, and Dr. Bluett a hydrocephalic fœtus.

I would direct the particular attention of the Society to the fact that almost every one of these specimens possesses a distinct and definite value of its own, has a direct bearing upon some point of pathology or practice in obstetric medicine, and that almost every specimen exhibited had no other interest than that I have mentioned, and none of that which attaches to the shops at Christmas.

The papers read before the Society number twenty-four, eighteen of which deal with subjects in midwifery, and six concern the diseases of women. No paper has been read on the diseases of children.

Dr. Pedley's paper on "Midwifery among the Burmese" was full of interest, and was illustrated by many drawings, a series of which the author presented to the Society.

Dr. Gibbons read an elaborate note of "A Case of Galactorrhœa," Dr. Cullingworth "A Case of Cæsarean Section," performed for contracted pelvis complicated with albuminuria; Dr. Swayne, a paper on "Hydrocephalus in Labour."

Dr. Matthews Duncan's paper on "Tonic Contraction of the Uterus without Completeness of Retraction" is a contribution to an obscure and hitherto unrecognised con-

dition. It is full of interest by reason of its important bearing on the causation of post-partum hæmorrhage and its treatment.

Dr. Herman's two papers on "A Case of Eclampsia, with Observations on the State of the Renal Function," and on "Bright's Disease during Pregnancy," are an important contribution to our knowledge of some of the conditions which prevail in these affections. The analysis of the urine and the observation of the variations in the eclamptic attacks, associated with changes in the urine, are suggestive, but further observations made on a wider basis are necessary before we can form a tenable theory of these diseases.

At the extra meeting of the Society, which was held in November, three papers were read, one by Dr. Herman, on "A Case of Delivery by the Vagina in Extra-Uterine Pregnancy when the Fœtus was Dead," one by Dr. Champneys on "A Case of Primary Laparotomy in the Second Half of Extra-Uterine Fœtation," and one by Dr. Williams on the same subject. The case read by Dr. Champneys is unique. The chief interest of the two last-named papers consists in the observations made on the history of the placenta before and after the extraction of the child.

The four papers of Dr. Champneys on "The Mechanism of the Third Stage of Labour," although apparently theoretical, are of a thoroughly practical character. Our knowledge of the mechanism of this stage of labour is very imperfect, and yet upon its management depends the welfare of the mother as much, if not more, than on the management of the first and second stages. These papers are the results of observations made in a large number of cases, under the most favourable circumstances, in a lying-in hospital. They necessarily involve theoretical considerations, but it would be difficult to exaggerate their value as a contribution towards the solution of the problems which they discuss, and the importance of their bearing on the treatment of the third stage of labour.

In the diseases of women, Dr. Herman read an elaborate paper on "Stricture of the Urethra," in which he reported some cases which had come under his observation, and tabulated the cases which had been previously published, concluding with an examination of the causes which lead to the condition, and the best method of treating this somewhat rare condition.

Dr. Matthews Duncan described a rare form of diseases —hæmorrhagic parametritis—with regard to the exact nature of which some differences of opinion appear to exist.

The same author read a paper on "Diabetes Insipidus during Pregnancy and Labour," pointing out the clinical similarity of cases of diabetes insipidus and of diabetes mellitus.

Mr. Meredith reported a "Case of Hæmatometra," produced by the breaking down of a fibroid tumour of the uterus, with occlusion of the uterine canal by twisting of the cervix,—a rare condition not hitherto described.

Dr. Griffith read an interesting paper on "Tubo-Ovarian Cysts," which elicited from Mr. Alban Doran, who had ransacked the museums of London for specimens illustrative of the condition, a speech which forms one of the best contributions yet made on the subject.

The first paper hitherto published with a view to determine the relative frequency of disease of the Fallopian tubes, was read before this Society by Dr. Lewers. He made an examination of the pelvic organs after death in 100 unselected cases met with in the dead-house of the London Hospital, and found the tube more or less dilated in seventeen of the cases. The subject is one which has not as yet been worked out in a methodical or scientific manner; it is so far chaotic and a field where the wildest imagination has free play, but which has not been entered by the spirit of true research. Dr. Lewers briefly described the appearance found in the seventeen cases, and practically limited himself to the one conclusion which I have stated—and wisely, for little else was

known of the patients. In so far the work is excellent, and we want more of the same character. It is only a beginning, however. Similar observations made in other series of hundreds of cases are called for, and much more difficult work has to be done before we have any real knowledge of tubal disease. We require the history of the cases, the symptoms, and the physical signs found on examination of such structures, and the post-mortem appearances before we can be in a position to estimate the importance of the suffering caused by, and the dangers arising from, these diseases and to diagnose them. I look forward with the hope that in the coming year contributions will be forthcoming which will bring us nearer a solution of this and many other problems in which the Society is interested.

Such are the papers which have been read before the Society during the year. There is nothing startling or wonder-inspiring in them. We have had no papers of that character. We have had no papers on 200 cases of total extirpation of the uterus without a death, or on 300 cases of fibroids removed without a fatality, and I am glad of it. For what are such papers worth? But little; they are but shouts of triumph for victory won by work such as Lister's; the work has been done and the battle fought before, and the success chronicled is the result of such work. Such papers do not further the progress of medicine, and their chief if not their only use is personal to their authors.

But what value is to be attached to the papers I have briefly described to you? The highest. They are the forces which push on the car of science,—which bring us nearer and near to the possession of an understanding of disease and the power of alleviating pain and curing suffering. It is true that they bring but little direct profit to their authors. The best scientific work does not meet with an immediate visible and palpable reward. It is such work, however, and the presence of many workers working in the spirit of true research, working upon sub-

jects which further the interests of suffering women, with the highest object and without a prospect of immediate reward, that constitutes the wealth and the strength of an obstetrical society, and it is upon the possession of such wealth that I congratulate you.

A vote of thanks to the retiring Honorary Secretary, Dr. Champneys, and the retiring Honorary Librarian, Mr. Alban Doran, was moved by Dr. POTTER, seconded by Dr. BOXALL, and carried unanimously.

Dr. CHAMPNEYS said that he would not deny a consciousness of a certain mixture of feelings on the present occasion. In one way he felt the same sensations as he did some years ago at the approach of the holidays, and after hard work, which was not, he regretted to say, always the prelude to his holidays. In another way he felt real sorrow that his term of office had come to an end. Four years was a measurable extent of time, and during the whole of that time he had experienced the greatest kindness and assistance from his fellow-officers, the Council, and the Society generally. Very much also depended on the President for the time being, and he feared none of his successors were likely to find their lot cast in such pleasant places as his had been. How could it be otherwise when he mentioned the names of Dr. Gervis, Dr. Potter, and, last, but not least, Dr. John Williams? He begged to thank the Officers, the Council, and the Society for the help they had given him in the past four years, and to express the same to Drs. Potter and Boxall for the very kind way in which they had proposed his name.

A vote of thanks to the retiring Vice-Presidents, Dr. Burchell and Dr. Herman, and to the other retiring members of Council, Mr. Argles, Dr. Rayner W. Batten, Dr. Burd, Mr. Elkington, Dr. Ingle, and Mr. Edward

W. Tait, was moved by Dr. WATT BLACK, seconded by Mr. F. H. GERVIS, and carried *nem. con.*

Mr. FREDERICK H. GERVIS said he had great pleasure in seconding this proposition, as the retiring members were all good men and true, and the Society was sorry to be deprived of their valuable services.

MARCH 7TH, 1888.

JOHN WILLIAMS, M.D., President, in the Chair.

Present—40 Fellows and 4 Visitors.

Books were presented by the St. Bartholomew's Hospital Staff, the St. Thomas's Hospital Staff, and the American Gynecological Society.

Alexander Morison, M.D.; A. D. Leith Napier, M.D.; and Howard Lyon Smith, L.R.C.P.Lond., were admitted Fellows.

James Armstrong, M.B.Edin. (Liverpool); E. H. Myddelton-Gavey, M.R.C.S. (Ipswich); and Charles R. Williams, M.B., C.M.Edin. (Ashby-de-la-Zouch), were declared admitted.

The following gentlemen were elected Fellows of the Society:—Henry Briggs, M.B. (Liverpool); Peter Cooper, L.R.C.P.Lond. (Blackheath); Thomas Babington Grimsdale, B.A., M.B.Cantab. (Liverpool); Guy Carleton Jones, M.R.C.S.; and Patrick Cumin Scott, B.A., M.B.Cantab. (Blackheath).

EXTRA-UTERINE FŒTATION.

By Aust Lawrence, M.D.

Dr. Aust Lawrence (Clifton) showed a four months' fœtus and a solid tumour which he had removed by abdominal section. It was a case of extra-uterine fœtation. The patient became pregnant and went on for seven weeks with only the ordinary symptoms of pregnancy. At the end of this time she was suddenly seized with acute pain and went into a state of most profound collapse. She rallied from this and went on for three and a half months, when she was seized with acute abdominal pain, and expelled a complete cast of the uterus; and she remained very ill for three weeks, when she was admitted into the Bristol General Hospital under Dr. Aust Lawrence's care. He diagnosed extra-uterine gestation, opened the abdomen, and found the fœtus immediately under the omentum, not enclosed in any definite sac. He removed the fœtus, leaving the placenta attached to the lower and back of the uterus and vagina. The cord was left hanging out of the lower end of the wound, and a piece of india-rubber tubing was also carried down to the placental site. This was left in ten days; on the fourteenth day the cord came away and the wound was completely healed. He also at the same operation removed the semi-solid tumour, which was a portion of a dilated Fallopian tube which had been the gestation sac until rupture at the end of the seventh week. The patient made a complete recovery.

Dr. Griffith stated that, from the account given by Dr. Aust Lawrence, it appeared possible that a rupture of the amnion and chorion had occurred some considerable time before the operation was performed, and that the fœtus, maintaining its connection with the maternal circulation through the imperfect placenta, had continued to develop though not floating in a bath of liquor amnii.

The deformity of the left arm, which was enveloped in the skin of the side of the thorax, might possibly be connected with this. The appearance of a tumour of the Fallopian tube made him feel certain that the blood was diffused through chorionic villi, and therefore that the whole ovum had not escaped from this tube, a point which could be settled by microscopic examination.

FŒTUS AND PLACENTA SUCCESSFULLY REMOVED IN A CASE OF TUBAL PREGNANCY.

By G. E. Herman, M.B.

Dr. Herman showed a fœtus with the Fallopian tube and attached placenta, which he had removed by abdominal section two hours and a half after rupture had taken place.

The patient was admitted into the London Hospital on Thursday, February 16th, with a post-uterine swelling but no signs of grave constitutional disease. On the morning of the 17th her condition was the same. A little before 1 o'clock she was seized with sudden abdominal pain and signs of collapse. Dr. Herman saw her shortly before 3; her pulse was then 150, and she was blanched and prostrate. As soon as the necessary preparations could be made (about 3.20 p.m.) he opened the abdomen and removed the fœtus and placenta now exhibited. The fœtus was of about four months' gestation. The placenta was attached to the right Fallopian tube. The patient had made a good recovery.

Dr. Herman remarked that the cases in which an extra-uterine gestation had been removed during the collapse immediately following rupture were very few. The great majority had not been operated on till some time after the primary hæmorrhage had ceased. He was not aware of any case in which the operation had been performed so soon after rupture as in this one. When the unavoidable delay that must usually attend the sending

for a surgeon and arranging for an operation was considered, it would be evident that cases must very rarely happen in which an operation could be done so promptly as it was in this case.

TUBO-ABDOMINAL PREGNANCY.

By F. G. Penrose, M.D.

A. B—, aged 25, under the care of Dr. Champneys. The left Fallopian tube near the abdominal end is distended, having a diameter of about one and a half inches. This is partially filled by placenta. The membranes contain a fœtus about three months old, measuring five inches from crown to heel. The placenta had apparently burst in the neighbourhood of the Fallopian tube.

The uterus is enlarged; body measures three and a quarter inches in length, neck one and a half inches. Thickness of uterine wall two thirds of an inch in thickness. The upper half of the body is covered by decidua vera, which is absent from the lower half.

The left Fallopian tube appears quite healthy towards the uterus. The left ovary contains two or three small corpora lutea, but the largest is not a quarter of an inch in diameter.

In the right Fallopian tube at the abdominal opening there is a cyst full of yellow fluid. The opening of the tube is blocked by firm adhesions almost cartilaginous in density.

The right ovary contains a large corpus luteum verum two thirds of an inch in diameter.

Several similar cases have been described, and the authorities are cited in 'Schröder's Geburtshülfe' for 1886, pp. 29, 30.

Dr. CHAMPNEYS said that abdominal section was performed as soon after rupture as arrangements could be made. The abdomen was full of blood, which gushed out in a fountain. The sac had implanted itself on the omentum and on a considerable tract of the descending colon, and could not therefore be removed. The patient nearly died on the table, the bleeding was stopped as well as circumstances permitted, but recurred subsequently and caused death. The implantation of the placenta was an element of good or bad fortune in these cases to the operator. Where the sac could be isolated the operation of removal was easy, and was likely to be successful; where it was situated as in the above case it might be practically impossible.

SCARLATINA DURING PREGNANCY AND IN THE PUERPERAL STATE.

By Robert Boxall, M.D., M.R.C.P.,
VISITING PHYSICIAN TO THE GENERAL LYING-IN HOSPITAL.

(Received 1st July, 1887.)

(*Abstract.*)

VI. *Clinical Relation of Scarlatina to Puerperal Septicæmia.*

A brief summary of the sixteen cases of undoubted scarlatina is given, and it is pointed out that in one case only were the scarlatinal manifestations associated with signs of septic poisoning.

Forty lying-in patients are known to have been exposed to one or more of the above cases of scarlatina. This series is presented in a tabular form, giving the time and duration of exposure and the course of the puerperium. On this evidence it is apparent that such exposure resulted in no detriment to the puerperium.

As it might be urged that the 300 patients or more admitted during the prevalence of scarlatina were to a greater or less extent exposed, a chart (together with the Percentage Tables from which it was constructed) is also appended. This indicates the morbility (as judged by the temperature) prevailing not only during the whole scarlatinal period, but includes, in addition, the three months which preceded the outbreak. From this it is evident that the prevalence of scarlatina in the hospital exerted no appreciable effect on other cases lying-in during the same period.

The special value of local antiseptic measures in scarlatina during the lying-in period is discussed.

The following conclusions are offered:

1. That infection by the poison of scarlatina *generally* produces in the puerpera a disease which presents *for the most part* the usual symptoms of scarlatina, and runs the ordinary course of the disease without the appearance of septic manifestations.

2. That the disease, in addition to the usual symptoms of scarlatina (to a certain extent modified), may *occasionally* present signs of septic poisoning; that, when present at the outset of the disease, pelvic inflammation and septicæmia may usually be regarded as accidental complications, but, at a later stage, such signs may be the expression of a septic process, analogous to the secondary throat of ordinary scarlatina.

3. That *in rare instances* the disease may assume a masked form, in which the ordinary signs of scarlatina are absent, or so slight and evanescent as to escape observation; and that, in some such cases, the only manifestation of the illness may be found in signs usually referred to septic poisoning. Such septic manifestations, again, may either result from accidental complication or stand in relation to scarlatina as secondary septic processes indirectly induced.

Hitherto my remarks have been confined to a series of sixteen cases, in some of which only could distinct evidence of exposure to scarlatina be established, but all of which presented undoubted evidence of the disease (although modified in some respects) marked by different degrees of severity. In most of the cases the illness was very slight, and the course of the puerperium was but little affected. In one case only were indications of pelvic inflammation present. All the mothers ultimately recovered. Four children were affected, of whom two died. Two children were stillborn, and one of these possibly succumbed to intra-uterine scarlatina.

Such is a brief summary of the scarlatina cases.

I would now direct the attention of the Society to a series of cases (see pp. 138—141) distinctly exposed to scarlatina, which, either in the labour-wards or in the lying-in wards,

were brought into contact with one or more of the sixteen cases of scarlatina above described. As I have previously stated, each delivery room was fumigated and cleaned after every six deliveries, and each lying-in ward after each second set of three patients. Should any case of scarlatina be introduced, only those patients occupying the ward between the admission of that case and the cleansing would therefore be exposed. And of those exposed, only a certain number would be brought into direct contact with the scarlatinal case—direct exposure; others occupying the ward after the scarlatinal patient had vacated it—indirect exposure. I may here restate also that on two separate occasions, first, in the middle of February, and again at the beginning of May, all the wards were thoroughly cleansed in succession before any fresh patients were admitted. Between December 26th, 1883, and December 31st, 1884, more than 300 patients were admitted. Thanks to the exact record kept of the position of each patient with regard to every other patient in the hospital on each day throughout the whole of this period, it is readily possible to dissociate those who were exposed from those who were not. It is found that forty women were exposed to one or more of the sixteen cases of scarlatina, twenty-one directly, and nineteen in an indirect manner. Among the former many were exposed indirectly as well. Some were exposed to more than one case (one to four, four to three, and six to two cases each). Twenty-two were exposed during labour (several during the puerperium as well), and of the remainder nine were exposed during the first three days of the puerperium; the residuum at a later period. In the cases exposed after labour only, the duration of exposure occupied a variable period of the puerperium, and averaged ten days to each case. Of the whole number twenty-five are said never to have had scarlatina, twelve to have been attacked in infancy and childhood, and one at fifteen, one at nineteen, and one at twenty years of age, fifteen in all.

An analysis of these cases gives thirteen without any rise of temperature, and twenty-seven with more or less fever. Of the latter, eight presented signs of pelvic inflammation; in others the pyrexia is accounted for in various ways. In four of the cases of pelvic inflammation the illness commenced either before or on the same day as exposure, thus rendering any causal relation doubtful, and the same may be said of seven cases of fever without pelvic inflammation.

By comparing the above series of cases with others lying-in under precisely similar conditions (exposure to scarlatina excepted) it appears that such exposure resulted in no detriment to the puerperium.

Bearing in mind, however, the difficulty of effecting complete isolation, and the possible transmission of the scarlatinal poison by a third person, nurse, midwife, or doctor, even when the greatest precautions are adopted, it may be urged, and with some reason, that each of the patients admitted subsequent to the first introduction of scarlatina may have been exposed to the influence of the poison in an indirect manner. It is then to the condition of the patients in the hospital, as a whole, that attention will now be directed.

To prevent misapprehension, I would briefly explain the method adopted in the construction of the chart. Each patient's temperature is taken every four hours, night and day, during the whole puerperium and recorded on a daily chart. Any rise of temperature above 100° F. is reckoned as fever. All fever cases are classified under four heads, according to the cause:

(1) Scarlatina.

(2) Pelvic inflammation and septicæmia.

(3) State of bowels and breasts.

(4) Other causes (*e. g.* nervous excitement), including for the most part trivial cases.

The number of patients with fever on any given day is computed by adding all the fever cases together, and this is expressed in the form of a daily chart of morbility.

Finally, by comparing these with the total number of patients in hospital, an average daily percentage of patients with fever has been obtained for each of the sixteen months dealt with in the accompanying chart. The exact figures from which the chart has been constructed are given in Percentage Table B (pp. 142—145).

The object in view being to institute a comparison between the prevalence of fever from scarlatina with that of fever from other causes, they are placed on separate bases, the former in the middle, the latter in the lower division of the chart (fever from scarlatina is there represented by a dark space bounded by a dotted line).

The middle division of the chart, however, refers only to the prevalence of scarlatina *as regards the pyrexial period of the disease*. The upper division of the chart, indicating *the number of patients with scarlatina (whether feverish or not)* multiplied by the duration of their stay in hospital (in days) is more truly representative of the prevalence of scarlatina. In this division of the chart the incubative stage of the disease is indicated by a dark space bounded by a continuous line.

Now, if it be granted that pyrexia in lying-in women may be taken as an indication of morbility, from a comparison of the upper and middle with the lower division of the chart, it is evident that the presence of scarlatina in the hospital exerted no appreciable effect on other cases lying-in during the same period. For what are the facts? Setting aside scarlet fever, other cases of illness, as indicated by pyrexia, showed a gradual decline throughout the whole period. This improvement, moreover, becomes still more manifest if the height of the fever be taken into account (Percentage Table C, pp. 142—145). Concerning this there can be no dispute, for in the data no diagnosis is involved.

On turning to those cases which are set down to pelvic inflammation and septic poisoning, a like improvement is manifest, with this difference, however, that they all but entirely cease after May, 1884. This highly satis-

factory condition, which has since been maintained, appears to have been brought about by the substitution at that period of corrosive sublimate for carbolic acid and Condy's Fluid as an antiseptic, and to the gradual improvement by the slow elaboration of antiseptic details.

The points in the chart to which particular attention is directed are that, during the prevalence of scarlet fever in the hospital, no interruption occurred in the gradual improvement which was taking place; and that before the introduction of scarlet fever into the institution, the cases of illness were both more numerous and of greater severity than after its introduction.

As the number (423) is larger than can be conveniently dealt with, case by case, the expedient has been adopted of massing all the cases in one chart. This chart indicates the morbility prevailing not only during the whole scarlatinal period, but also includes the three months (dealing with eighty-two admissions) which preceded the introduction of the first case. As regards mortality, I may here state that during the sixteen months two deaths occurred among 423 patients delivered. One death took place on January 8th, 1884, three weeks after delivery, from peri-metric abscess which resulted apparently from two traumatic perforations in the roof of the vagina, the cause of which could not be determined, and the other on March 27th, 1884, five weeks after delivery, from septic phlebitis. In neither case could any exposure to scarlatinal poison be traced.

While it is generally admitted that the characteristic signs of scarlatina are modified in the puerperal state to such an extent that the true nature of the affection may pass unrecognised, there are some who maintain that in such cases the disease manifests itself by the signs of septic poisoning, and that, generally speaking, as the former diminish in intensity the latter increase, so that it not infrequently happens that the only signs by which the effect of scarlatinal poison can be recognised are similar to those commonly regarded as manifestations of

puerperal septicæmia. In other words, it is contended that the clinical course of scarlatina (the result of scarlatinal infection) in the puerperal state is frequently indistinguishable from that of puerperal fever (the result of septic infection). This view, however, by no means presupposes that the diseases thus produced are essentially of the same nature. Obviously, though the clinical course may be the same, there is yet an etiological difference, a difference which by some has been overlooked with the production of much confusion. Dr. Braxton Hicks, who has so ably maintained the clinical identity of scarlatina with septicæmia in the puerperal state, is very careful to preserve the distinction indicated above, for he clearly suggests the possibility of a puerperal disease, produced by scarlatinal infection and in its clinical features simulating so-called puerperal fever, giving rise to scarlatina presenting the ordinary symptoms in others. Dr. Galabin appears to adopt the same view. The nature of the evidence by which this clinical identity has been sustained has already been mentioned. It is impossible to settle the question by reference to selected cases. In speaking on this subject in the discussion before this Society in 1875, Dr. Braxton Hicks says, "The only proof (*i. e.* that scarlatina does not produce a disease simulating puerperal septicæmia) reliable is to be able to say that frequently cases of scarlatina have been introduced into lying-in wards and no ill effect followed." It is precisely such proof as this that I now bring before the Society. Again, Brown, referring to an epidemic of scarlatina in Queen Charlotte's Lying-in Hospital ('Brit. Med. Journ.,' February, 1862, p. 144), relates nine cases in which the mothers were affected and all recovered. Four children were also affected. He concludes, "During the whole time in which these cases were being treated in the hospital, though there were the usual number of patients delivered at the same time, none had any symptoms which would lead me to suppose the fever affected them in any way." Other instances of a similar nature might be mentioned.

What evidence may be derived from the introduction of scarlatina into the General Lying-in Hospital?

Firstly, as regards the sixteen cases of undoubted scarlatina:

In one case only were the scarlatinal manifestations associated with signs of septic poisoning. Upon such evidence I am inclined to agree with Olshausen that "inflammatory affections of the pelvic organs are of the greatest rarity, and are only to be regarded as casual complications." To this point I shall return presently.

Secondly, with regard to the forty cases in which distinct exposure to scarlatina can be traced:

Instances of local pelvic inflammation were neither of more frequent occurrence nor of greater severity than in others in which no distinct exposure had taken place.

Lastly, with regard to the general health of the hospital during the prevalence of scarlatina:

No detrimental effect was produced (four, or possibly six cases of undoubted scarlatina excepted).

None of the infants failed with scarlatina, and no case of scarlatina appears to have arisen from any of the cases which were attended with illness, though particular inquiries were in each case made as much as a month after the patient left the hospital. On the other hand, it is interesting to note that two of the scarlatinal cases *after leaving the hospital* probably proved the source of infection to others.

Against such evidence, however, it may be urged that the strict antiseptic precautions adopted in the hospital proved inimical to the transmission of the scarlatinal poison. It must be remembered, however, that certainly in four (possibly in six) instances *the poison was able to exert its influence in the hospital, and produced scarlet fever.*

And here the question arisis, whether the system of antiseptic douches in vogue may, though incapable of arresting the introduction of scarlatinal poison (which in all probability obtains an entrance through the ordinary channels, as in cases of so-called surgical scarlatina under

Listerian dressings), act as a safeguard against the supervention of septic poisoning in such cases. Fever *per se*, by the mere fact of elevating the temperature, renders especially suitable one of the conditions necessary to the development of sepsis. But, further than this, many of the blood diseases, particularly erysipelas, diphtheria, smallpox, and scarlatina, are prone to take on a septic character in their later stages. As ergot becomes implanted on the rye, so septic poison is engrafted on the scarlatinal. In ordinary cases of scarlatina this septic process is especially prone to attack the throat, but other organs and even the general system may be selected for attack. In the puerperal state, however, the pelvic organs being already in a damaged condition, are especially signalled out for attack, and the stress of the disease appears to fall upon them by preference. McClintock ('Dubl. Quart. Journ. Med. Sc.,' vol. xli, 1866, p. 53) mentions two cases in which peritonitis appeared late in the course of the disease. Several others have been recorded. In Case 3 the slight perimetritic symptoms present at the outset had all but disappeared, when, on the twelfth day of the puerperium, the temperature rose with a rigor to 104°, and signs of general peritonitis presented.

It seems to me at least possible that scarlatina in the puerperal state may develop into a septicæmia about the second week of the illness, and that antiseptic douching may tend to prevent such development. I am led more especially to make this remark by the fact that, whereas in none of the cases treated in hospital did the lochia take on an offensive character such as is usually associated with decomposition, in several cases treated elsewhere, and in which such antiseptic measures were omitted, the discharges without exception became abominably foul. On these grounds, therefore, I would urge the advisability of employing the antiseptic douche in cases of puerperal scarlatina.

With regard to the clinical relation of scarlatina to puerperal septicæmia, the following conclusions are offered:

(1) That infection by the poison of scarlatina *generally* produces in the puerpera a disease which presents *for the most part* the usual symptoms of scarlatina and runs the ordinary course of the disease, without the appearance of septic manifestations.

(2) That the disease, in addition to the usual symptoms of scarlatina (to a certain extent modified), may occasionally present signs of septic poisoning; that, when present at the outset of the disease, pelvic inflammation and septicæmia may usually be regarded as accidental complications; but, at a later stage, such signs may be the expression of a septic process; analogous to the secondary throat of ordinary scarlatina.

(3) That in rare instances the disease may assume a masked form, in which the ordinary signs of scarlatina are absent, or so slight and evanescent as to escape observation; and that in some such cases the only manifestation of the illness may be found in signs usually referred to septic poisoning. Such septic manifestations again, may either result from accidental complication or stand in relation to scarlatina as secondary septic processes indirectly induced.

To the first of the three propositions which were enunciated in the introductory part of this paper, I am disposed to give an affirmative answer. The qualification, "for the most part," indicated above in italics, has reference to the special modification of certain symptoms, and to this I would append a rider, "When the disease breaks out during pregnancy its symptoms are unmodified as long as the pregnancy persists."

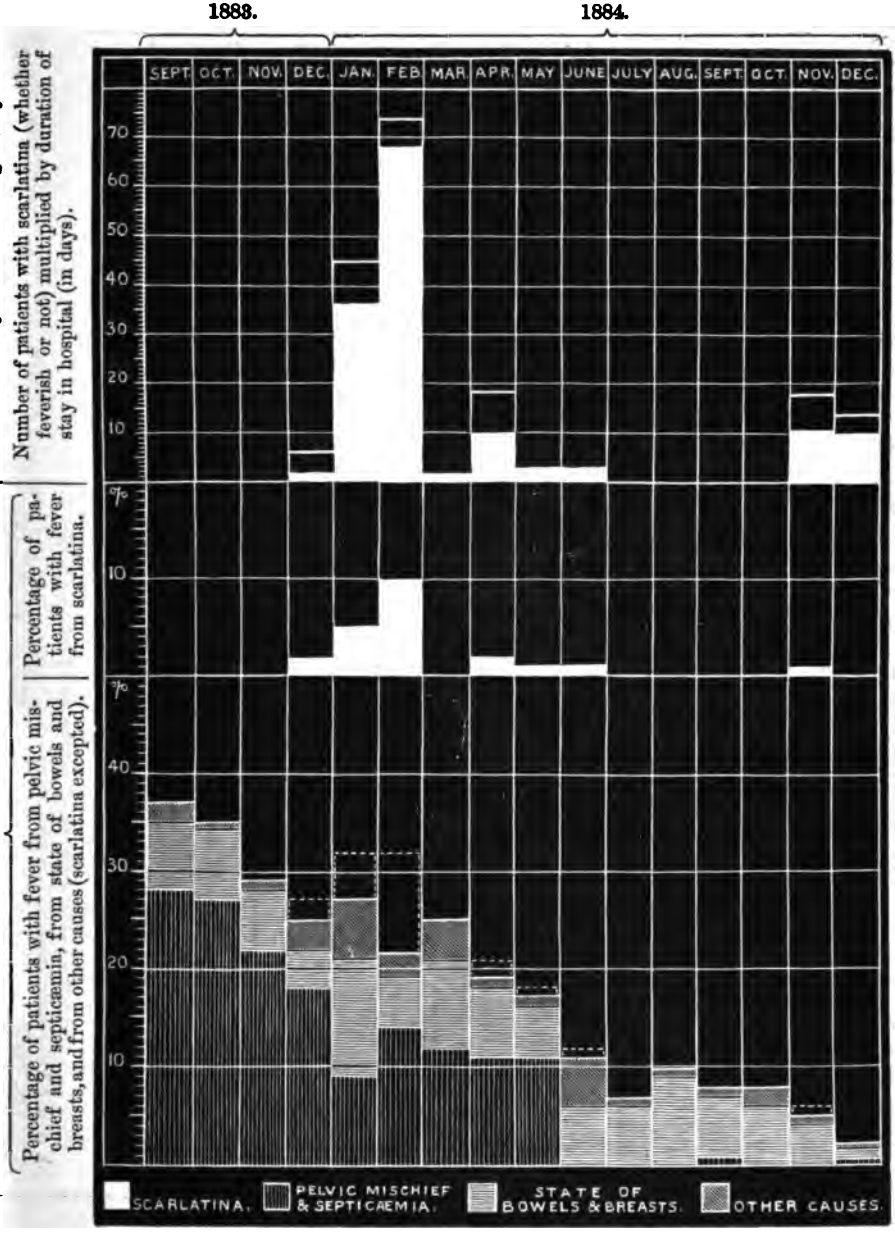
To the second I assent in so far as the mere association with local and general lesions, such as are produced by ordinary septic poison, is concerned. That such association, however, is of frequent occurrence is negatived both by the cases which I have related, and by Olshausen's elaborate analysis. That any *direct* causal relation between septic manifestations and the scarlatinal poison exists appears contrary to experience, but that an

indirect relation may be established is at least possible, and indeed is highly probable, as I have already stated.

To the third I also give a qualified assent, inasmuch as similar masked forms are also encountered in non-puerperal patients, but with the same reservations as are appended to the second. Apart from the puerperal state, scarlatina sometimes assumes a masked form from the tardy or irregular development or entire absence of one or more of its leading symptoms. In such cases it may show but little intensity, and the same holds true in the puerperal condition. But in certain instances masking may result from grave intercurrent disease, or depend either on the assumption of a virulent dose of poison or on a diminished power of the constitution to combat its injurious effects, so that the patient often succumbs before the usual manifestations have appeared. In the puerperal condition, owing in part to grave disorders incidental to the lying-in woman and in part to the diminished power of resistance engendered by delivery, such masked forms of the affection are apt to prove exceptionally fatal.

I may here remark that the only case of obscure illness during the puerperium which was looked upon as possibly resulting from scarlatinal infection is that of Z—, the twelfth case in the series exposed to scarlatina *in the hospital* (see p. 20). Curiously enough, this same case was also exposed *before admission*, not only to the first case in the scarlatina series, but also to the same source of infection as that case. There is, however, nothing in the subsequent history of the case which will serve to determine its etiological nature.

Chart showing Morbility as compared with Prevalence of Scarlatina among patients in the Lying-in Wards of the General Lying-in Hospital.



NOTE.—The *incubative stage* of scarlatina is represented in the upper division of the chart by a dark space bounded by a continuous line. The *prevalence of fever* from scarlatina is represented in the lower division of the chart by a dark space bounded by a dotted line. This space corresponds to the middle division of the chart.

Tabulated Series of Forty Lying-in Cases known to have been Exposed to one or more of the preceding Cases of Scarlatina.

	COURSE OF PUERPERIUM.	EXPOSURE TO INFECTION.
	DIRECT EXPOSURE.	NOTE.—Roman Numerals (XV) refer to the case of scarlatina to which exposure occurred, and the letters which follow to the stage of the disease. α=incubative, β=eruptive, γ=post-eruptive.
	NOTE.—Italic Numerals (*XV*) indicate number of case in order of sequence.	
	GROUP I.—DURING LABOUR.	
	(*a*). *Never had Scarlatina.*	
(1)	*XIII.* No fever. No rash or symptom of scarlatina	Ind. during labour. Dir. i—xiii. II, α, β, γ.
(2)	*XXII.* No fever. No rash or symptom of scarlatina	Ind. during labour and i—xiv. Dir. i—vii. VI, α, β; II, α, β, γ.
(3)	*XIX.* Slight fever. T. rose to 101·2° on iii, and to 100·6° on iv, from constipation; fell to normal when bowels were freely relieved. No rash or symptom of scarlatina.	Ind. during labour. Dir. i—ix. IV, α, β.
(4)	*XXI.* Slight perimetritis on left side. T. rose to 101·4° on iii, persisted for two days, and, after remitting for two more, fell to normal on viii. V. E. on x. "Cervix drawn to left side; no deposit." No rash or symptom of scarlatina	Ind. and dir. during labour. Dir. i—vii. Ind. viii—xiv. IV, α; V, α, β; I, γ.
(5)	*XXIX.* No fever. Glyc. of belladon. applied to breasts on iv. Well-marked eruption appeared on upper part of chest on vii where belladonna had been applied. No sore-throat or other symptom of scarlatina	Ind. during labour. Dir. i—iv. IX, α, β.
	(*b*). *Previously had Scarlatina.*	
(6)	*XV.* No fever. No rash or symptom of scarlatina	Ind. 4 days before labour. Dir. 4 days immediately preceding labour. Ind. x—xv. III, α; II, β, γ; I, γ.
(7)	*XX.* No fever. No rash or symptom of scarlatina	Ind. during labour. Dir. iii—ix. Ind. ix—xiv. VI, α; V, α, β; I, γ.
(8)	*XXIII.* Considerable fever. T. rose on iii to 102·2°, and on vi to 101°. On ix and x also 1° above normal, falling on each occasion when bowels were relieved. No rash or symptom of scarlatina	Ind. during labour. Dir. i—v. Ind. i—xv. VI, α, β; II, α, β, γ; I, γ.
(9)	*XIV.* Nausea, giddiness, frontal headache and pain between scapulæ on iv and v, with rise of T. to 102°—103°. Slight papular eruption round waist vi—ix; appeared after free nocturnal perspiration. No desquamation, sore-throat, &c.	Ind. during labour. Dir. i—xiii. II, α, β, γ.
	GROUP II.—DURING FIRST THREE DAYS OF PUERPERIUM.	
	(*a*). *Never had Scarlatina.*	
(1)	*XXXIII.* No fever. No rash or symptom of scarlatina	Dir. i—iii. XIII, α, β.
(2)	*XXVIII.* Single rise of T. on v to 103°, with flushed face, furred tongue, and headache. T. declined immediately bowels acted, with relief of symptoms. No rash or	Dir. i—iv. IX, α, β.

		to 101·4°, apparently from constipation; and fell to normal as soon as bowels were freely relieved. Slight tenderness, however, on deep pressure in left iliac fossa on x. Secondary hæmorrhage occurred, and placental polypus removed four weeks after delivery. No rash or symptom of scarlatina	Dir. iii—xiv. I, α, β, γ.
(4)		*XII.* Obscure pelvic inflammation and constipation. T. rose on ii to 103°, and persisted for three days, then fell to normal. On ix, xii, and xxiii T. again rose steadily and reached 104·2°, and then fell almost to normal, and continued so till xviii, when she left hospital. For several weeks after this occasional bouts of high temperature without adequate cause. Mobility of uterus impaired. No rash or symptom of scarlatina	Dir. ii—xvi. Also exposed before admission (see Case Z, p. 20). III, α, β, γ.
		(*b*). *Previously had Scarlatina.*	
(5)		*XXXV.* No fever. No rash or symptom of scarlatina	Dir. iii—vi. XIV, α, β.
(6)		*II.* Slight fever. T. rose on iv to 101·2° from loaded state of bowel and engorged breasts, and occasionally to 100°—101°, from viii—xxv, from cystitis. No rash or symptom of scarlatina	Dir. ii—xvi. Ind. xvi—xxxi. I, α, β, γ.
		GROUP III.—LATER IN PUERPERIUM.	
		(*a*). *Never had Scarlatina.*	
(1)		*XI.* Very slight fever. Single rise of T. on iv to 100·4°, when milk came in. No rash or symptom of scarlatina	Dir. iv—x. Ind. x—xiv. II, α, β; I, γ.
(2)		*XXXIV* Transitory rise to 100·4° on iii. T. fell immediately bowels were relieved. Another transitory rise occurred on viii to 100·8° from nervous disturbance. Slight, blotchy, papular rash on abdomen and thighs on v; almost gone on vi; disappeared on viii. No scarlatinal symptoms	Dir. v—viii. XIV, α, β.
(3)		*XVIII.* Parametritis on left side. T. ran up on iii to 103·8°, and continued at 103°—105°, with considerable remissions, till xiii, when it suddenly declined to normal. No rash, but throat sore; uvula and fauces red and congested on vii, probably syphilitic. No other indication of scarlatina	Dir. iv—xii. IV, α, β.
		(*b*). *Previously had Scarlatina.*	
(4)		*XXXVIII.* Slight fever. Naturally delicate. T. 1° above normal, associated with dysenteric diarrhœa. No rash or symptom of scarlatina	Dir. xiv, xv. XIV, α; XVI, γ.
(5)		*VI.* Considerable fever. Severe constipation, and, at outset, some distension of breasts. T. began to rise on ii, and on iii reached 103·6°, which point was maintained till vii. Began to decline when bowels were relieved, and became normal on x. Rose again on xiii, and reached 104·2°, dropped to 101° on xiv, and became normal on xvi. No rash or symptom of scarlatina	Dir. vii—ix. Ind. ix—xvi. I, γ.
(6)		*X.* Prolonged fever. Parametritis on left side. T. rose on iii to 102°, and continued to reach same point till viii. On x again rose, and reached 103·6°, but declined immediately. From xvi—xxv rose almost daily to 101°—102°, occasionally to 103°, and subsequently continued to rise occasionally little above 100° till lxii. From that time till discharge, 16 days later, normal. No rash or symptom of scarlatina	Ind. xv—xliv. Dir. xxiii—xxxviii. I, γ; III, γ; VII, β, γ; IV, α, β, γ.

	COURSE OF PUERPERIUM.	EXPOSURE TO INFECTION.
	INDIRECT EXPOSURE ONLY.	Note.—Roman Numerals (XV) refer to the case of scarlatina to which exposure occurred, and the letters which follow to the stage of the disease. α=incubative, β=eruptive, γ=post-eruptive.
	Note.—Italic Numerals (*XV*) indicate number of case in order of sequence.	
	Group IV.—During Labour.	
	a). Never had Scarlatina.	
(1)	*XXXVIII.* No fever. No rash or symptom of scarlatina	Ind. during labour xi—xiv. XVI, γ; XV, β.
(2)	*XXXIX.* No fever. No rash or symptom of scarlatina	Ind. during labour. XIV, γ.
(3)	*XXXI.* Slight fever. T. somewhat irregular, rose on v to 101°, and to 100·8° on following day. On x rose with chill to 102°, following day 101°, on both occasions from constipation. No rash or symptom of scarlatina	Ind. during labour. IX, α.
(4)	*XL.* Slight fever. Cystitis. Severe dysenteric diarrhœa and aphthous ulceration of mouth, tonsils, and vulva. T. rose to 100·2° on vi, and again ran up on vii suddenly to 102·6° (throat affection). It declined immediately after. No rash or other symptom of scarlatina	Ind. during labour. XVI, α.
(5)	*V.* Considerable fever. Bronchitis and cystitis. T. rose to 100·2° on iii and iv, to 101° on v, to 101·8° on vi, and to 103·6° on vii (patient very hysterical), but declined next day to normal, and remained so. No rash or symptom of scarlatina	Ind. during labour. I, α.
(6)	*IX.* Considerable fever. T. rose daily for first seven days to 100° from loaded bowel, and on ix to 101·2°, and on x to 103·6°, but fell to normal immediately intestinal irritation was removed by castor-oil. No rash or symptom of scarlatina	Ind. during labour. I, α.
(7)	*XXX.* Considerable fever. T. rose on iii, when milk came in with chilliness, frontal headache, and flushed face, and reached 104·6°, but fell immediately bowels were relieved to 100°; became quite normal on following day. No rash or other symptom of scarlatina	Ind. during labour. IX, α.
(8)	*XXXII.* Considerable fever. Perimetritis. T. rose on ii, with prolonged rigor, to 103·8°; abdomen tender. Tongue coated, papillæ little enlarged. T. 102° on iii, and 101·2° on iv. Continued to rise to 100° till vii, when suture, which had been causing irritation, was removed from perinæum. No rash or other symptom of scarlatina	Ind. during labour. IX, α.
(9)	*III.* Considerable fever. Perimetritis, cystitis, ulceration of labia, and constipation. T. very irregular. Rose to 103° on iii, marked remission on v, normal on vii. Blotchy urticaria on elbows and knees, ix—xii, accompanied by second rise, reaching 103·6° on x; fell to normal when bowels were freely open on xii. Slight subsequent rise from state of bowels. No other symptom of scarlatina	Ind. during labour and xvii—xxvii. I, α, γ.

(10)	(*b*). ***Previously had Scarlatina.***	
	VII. No fever. No rash or symptom of scarlatina	Ind. during labour and xv—xx. I, *a*, *γ*.
(11)	*XXXVI.* No fever. No rash or symptom of scarlatina	Ind during labour. XIV, *a*.
(12)	*XXIV.* Very slight fever. Single rise on iv to 100·6°, probably from loaded bowel. Faint papular eruption on abdomen, limited to situation of fomentation on vi, associated with constipation, flatulence, and pyrosis. Symptoms and eruption disappeared two days later. No other sign of scarlatina	Ind. during labour and i—xiv. VI, *a*; III, *a*, *β*, *γ*.
(13)	*IV.* Considerable fever. Perimetritis. T. rose on iii, with rigor, to 103°, and on iv to 102·4°. Normal next day. Some abdominal tenderness till viii. V. E. on ix, nothing abnormal. No rash or symptom of scarlatina	Ind. during labour. I, *a*.
	GROUP V.—DURING FIRST THREE DAYS OF PUERPERIUM.	
	(*a*). ***Never had Scarlatina.***	
(1)	*XXV.* No fever. No rash or symptom of scarlatina	Ind. i—xiv. III, *a*, *β*, *γ*.
(2)	*XXVI.* High fever. Bronchitis, cystitis, and chronic Bright's. Ill on admission. T. very irregular; 101°—102° from i—iv; normal v; rose again same day, with shiver, to 103°—104° till viii. Normal ix; bronchitis and cystitis almost well, and less albumin. Papillæ of tongue enlarged throughout. Dyspeptic symptoms. Pelvic organs normal. No rash or other symptom of scarlatina	Ind. i—xvii. III, *a*, *β*, *γ*; IV, *a*, *β*.
(3)	*XXVII.* Considerable fever. T. rose to 101° on iv, and to 103° on v, but declined to normal on vii, when bowels were freely open. Faint papular eruption, limited to situation of fomentation over abdomen, on vi. No other symptom of scarlatina	Ind. i—xiv. III, *a*, *β*, *γ*.
	GROUP VI.—LATER IN PUERPERIUM.	
	(*a*). ***Never had Scarlatina.***	
(1)	*XVI.* No fever. No rash or symptom of scarlatina	Ind. x—xv. I, *γ*.
(2)	*XVII.* Slight fever. Considerable constipation and some bronchitis. T. 1° above normal from labour till x. No rash or symptom of scarlatina	Ind. ix—xiv. I, *γ*.
	(*b*). ***Previously had Scarlatina.***	
(3)	*VIII.* Slight fever. Some constipation and hysteria. T. rose on vi to 101·4°; normal vii; rose again on viii to 102·2°, but declined when bowels were freely relieved on xi and xii. No rash or symptom of scarlatina	Ind. xii—xv. I, *γ*.

Percentage Tables of Morbility (as gauged by the temperature) Hospital for sixteen months,

Table A.	Sept., 1883 (part). No.	Sept., 1883 (part). Percentage.	Oct., 1883. No.	Oct., 1883. Percentage.
Number of patients admitted who during puerperium had:				
Fever from scarlatina	0	0·000	0	0·000
„ „ pelvic mischief and septicæmia	13	48·148	9	31·034
„ „ state of bowels and breasts	12	44·444	9	31·034
„ „ other causes	1	3·703	3	10·344
	26	96·296	21	72·413
No fever	1	3·703	8	27·586
Total	27	100·000	29	100·000

Table B.	No.	Percentage.	No.	Percentage.
Average daily number of patients in hospital:				
With fever from scarlatina	0·000	0·000	0·000	0·000
„ „ pelvic mischief and septicæmia	4·769	27·555	4·483	26·886
„ „ state of bowels and breasts	1·307	7·555	1·322	7·930
„ „ other causes	0·307	1·777	0·032	0·193
	6·384	36·888	5·838	35·009
With no fever	10·923	63·111	10·838	64·990
Total	17·307	100·000	16·677	100·000

Table C.	Whole amount.	Amount per patient.	Whole amount.	Amount per patient.
Average daily amount of fever (in degrees above 100°):				
From scarlatina	0·000	0·000	0·000	0·000
„ pelvic mischief and septicæmia	13·923	2·919	10·903	2·435
„ state of bowels and breasts	1·846	1·411	3·870	2·926
„ other causes	0·538	1·750	0·032	1·000
Total	16·307	2·554	14·806	2·535

among patients in the lying-in wards of the General Lying-in ending December, 1884.

Nov., 1883.		Dec., 1883.		Jan., 1884.		Feb., 1884.		March, 1884.		April, 1884.	
No.	Per-centage.	No.	Per-centage.	No.	Per-centage.	No.	Per-centage.	No.	Per-centage.	No.	Per-centage.
0	0·000	1	6·250	5	18·518	1	5·882	1	4·761	4	13·793
10	30·303	5	31·250	4	14·814	2	11·764	1	4·761	3	10·344
8	24·242	5	31·250	7	25·925	6	35·294	11	52·380	11	37·931
5	15·151	2	12·500	3	11·111	3	17·647	1	4·761	1	3·448
23	69·696	13	81·250	19	70·370	12	70·588	14	66·666	19	65·517
10	30·303	3	18·750	8	29·629	5	29·411	7	33·333	10	34·482
33	100·000	16	100·000	27	100·000	17	100·000	21	100·000	29	100·000
No.	Per-centage.	No.	Per-centage.	No.	Per-centage.	No.	Per-centage.	No.	Per-centage.	No.	Per-centage.
0·000	0·000	0·161	1·766	0·645	4·773	1·103	9·726	0·000	0·000	0·233	1·794
4·000	22·388	1·645	18·021	1·193	8·830	1·620	14·286	1·483	12·533	1·500	11·538
1·000	5·597	0·387	4·240	1·612	11·933	0·551	4·863	1·096	9·264	0·866	6·666
0·266	1·492	0·258	2·826	0·838	6·205	0·379	3·343	0·419	3·542	0·100	0·769
5·266	29·477	2·451	26·853	4·290	31·742	3·655	32·218	3·000	25·340	2·700	20·769
12·600	70·522	6·667	73·147	9·225	68·257	7·689	67·781	8·838	74·659	10·300	79·230
17·866	100·000	9·129	100·000	13·516	100·000	11·344	100·000	11·838	100·000	13·000	100·000
Whole amount.	Amount per patient.	Whole amount.	Amount per patient.	Whole amount.	Amount per patient.	Whole amount.	Amount per patient.	Whole amount.	Amount per patient.	Whole amount.	Amount per patient.
0·000	0·000	0·164	1·000	1·806	2·800	2·724	2·468	0·000	0·000	0·466	2·000
10·233	2·558	3·903	2·372	8·064	2·567	3·482	2·148	4·548	3·065	5·100	3·400
1·766	1·766	1·096	2·833	3·774	2·340	0·758	1·375	2·548	2·323	1·600	1·846
0·333	1·250	0·548	2·125	1·387	1·653	1·000	2·636	0·709	1·692	1·300	3·000
12·333	2·341	5·708	2·328	10·031	2·338	7·965	2·179	7·806	2·602	7·466	2·765

TABLE A.	May, 1884. No.	May, 1884. Per-centage.	June, 1884. o.	June, 1884. Per-centage.
Number of patients admitted who during puerperium had:				
Fever from scarlatina	0	0·000	1	3·703
„ „ pelvic mischief and septicæmia	0	0·000	0	0·000
„ „ state of bowels and breasts	4	21·052	7	25·925
„ „ other causes	3	15·789	5	18·518
No fever	7	36·842	13	48·148
	12	63·157	14	51·851
Total	19	100·000	27	100·000

TABLE B.	No.	Per-centage.	No.	Per-centage.
Average daily number of patients in hospital:				
With fever from scarlatina	0·064	0·865	0·100	0·765
„ „ pelvic mischief and septicæmia	0·838	11·255	0·000	0·000
„ „ state of bowels and breasts	0·354	4·761	0·733	5·612
„ „ other causes	0·064	0·865	0·700	5·357
With no fever	1·322	17·748	1·533	11·734
	6·129	82·251	11·533	88·265
Total	7·451	100·000	13·066	100·000

TABLE C.	Whole amount.	Amount per patient.	Whole amount.	Amount per patient.
Average daily amount of fever (in degrees above 100°):				
From scarlatina	0·129	2·000	0·100	1·000
„ pelvic mischief and septicæmia	2·193	2·615	0·000	0·000
„ state of bowels and breasts	0·516	1·454	0·866	1·181
„ other causes	0·064	1·000	1·733	2·476
Total	2·903	2·195	2·700	1·760

July, 1884.		Aug., 1884.		Sept., 1884.		Oct., 1884.		Nov., 1884.		Dec., 1884.	
No.	Per-centage.	No.	Per-centage.	No.	Per-centage.	No.	Per-centage.	No.	Per-centage.	No.	Per-centage.
0	0·000	0	0·000	0	0·000	0	0·000	3	10·714	0	0·000
0	0·000	0	0·000	1	3·333	0	0·000	0	0·000	1	2·857
11	33·333	14	41·176	6	20·000	10	29·411	5	17·857	3	8 871
4	12·121	3	8·823	2	6·666	4	11·764	3	10·714	0	0·000
15	45·454	17	50·000	9	30·000	14	41·176	11	39·285	4	11·428
18	54·545	17	50·000	21	70·000	20	58·823	17	60·714	31	88·571
33	100·000	34	100·000	30	100·000	34	100·000	28	100·000	35	100·000

No.	Per-centage.	No.	Per-centage.	No.	Per-centage.	No.	Per-centage.	No.	Per-centage.	No.	Per-centage.
0·000	0·000	0·000	0·000	0·000	0·000	0·000	0·000	0·133	1·015	0·000	0·000
0·000	0·000	0·000	0·000	0·133	0·784	0·000	0·000	0·000	0·000	0·032	0·217
0·967	6·000	1·290	8·528	1·000	5·882	0·838	5·842	0·566	4·314	0·225	1·521
0·193	1·200	0·225	1·492	0·266	1·568	0·354	2·471	0·133	1·015	0·064	0·434
1·161	7·200	1·516	10·021	1·400	8·235	1·193	8·314	0·833	6·345	0·822	2·173
14·967	92·800	13·612	89·978	15·600	91·764	13·161	91·625	12·300	93·654	14·516	97·826
16·129	100·000	15·129	100·000	17·000	100·000	14·354	100·000	13·133	100·000	14·838	100·000

Whole amount.	Amount per patient.	Whole amount.	Amount per patient.	Whole amount.	Amount per patient.	Whole amount.	Amount per patient.	Whole amount.	Amount per patient.	Whole amount.	Amount per patient.
0·000	0·000	0·000	0·000	0·000	0·000	0·000	0·000	0·333	2·500	0·000	0·000
0·000	0·000	0·000	0·000	0·433	3·250	0·000	0·000	0·000	0·000	0·064	2·000
1·064	1·100	1·854	1·050	1·266	1·266	1·151	1·384	0·700	1·235	0·418	1·857
0·193	1·000	0·290	1·285	0·500	1·875	0·548	1·545	0·233	1·750	0·096	1·500
1·258	1·083	1·645	1·085	2·200	1·571	1·709	1·432	1·266	1·520	0·580	1·800

Example.—In December, 1883, sixteen patients were admitted to hospital. Of these—thirteen *during some part of* the lying-in period had fever from various causes, whereas three had no rise of temperature above 100° F. (Table A).

The average *daily* number of patients in hospital throughout the same month was 9·129—the average daily number of feverish patients being 2·451 against 6·667 without fever (Table B).

Finally, the *daily* amount of fever (in degrees above 100°) throughout the same month averaged 5·708°, giving for each feverish patient during the pyrexial attack a daily average temperature of $100° + \frac{5·708°}{2·451°} = 2·328°$, *i. e.* 102·328° F. (Table C).

VII. *Treatment of Scarlatina during Pregnancy and in the Puerperal State.*

(Received 1st July, 1887.)

(*Abstract.*)

After referring in very brief terms to remedial measures, the author discusses the means which should be adopted to prevent the spread of scarlatina to pregnant and parturient women.

He points out the advisability on the one hand of isolating all scarlatinal cases and disinfecting all contaminated articles, and on the other of shielding pregnant and parturient women from the many risks of scarlatinal infection which surround them, and, when possible, of removing such patients from any district in which the disease is prevalent.

The influence of a third person as a vehicle of infection is discussed with special reference to the conditions under which it is likely to be exercised, and, finally, the measures which may be adopted to counteract that influence, are pointed out.

It is concluded, finally, that, as the poison may be carried not only directly by the hands, but also indirectly by the clothes and general surface of the body, and possibly also by the breath, and subsequently given off into the atmosphere (from which it is inhaled by the patient), thorough washing and disinfection of the hands is not sufficient to insure protection, but that a disinfectant bath, a complete change of clothing, and active outdoor exercise, should be also included in the necessary precautions, and that these measures should be adopted not only by the doctor, but also by all other persons who have been brought into contact with scarlatinal poison, and especially by the nurse, prior to attending on a lying-in woman or even visiting a patient who is advanced in pregnancy.

The treatment adopted in the sixteen cases of scarlatina on which the foregoing remarks have been founded, may be dismissed in a very few words. Beyond the administration of carbonate of ammonia at the outset of

the attack, the measures employed were mainly symptomatic and call for no special mention. The scarlatinal attack was treated on the same lines as ordinary scarlatina, while the usual means adopted during the puerperium were at the same time enforced. Reference has already been made to the extra care required to counteract the tendency to decomposition of the discharges.

It is rather to preventive than to remedial measures that attention is now directed,—to find an answer to the question, "What means should be adopted to prevent the spread of scarlatina to pregnant and to parturient women?"

The enhanced liability of women to contract scarlatina towards the end of pregnancy and during the first few days of the puerperium has already been pointed out. The necessity for precautionary measures is at once apparent, and the advisability of removing a pregnant woman from an infected house, or even from a district in which scarlatina is prevalent, would, I presume, commend itself to everyone, and, in passing, I would direct attention to the fact (which the cases related clearly show) that the protective power of a previous attack is liable to break down during pregnancy and in the lying-in period. Equally, too, the strict isolation of all scarlatinal cases, the disinfection of articles of clothing and bedding, and the cleansing of infected rooms, would recommend itself to everyone who has charge of such cases. I would only point out, in passing, that such disinfection to be effectual should be practised as near the source of infection as possible—in the infected room itself, so that nothing should pass out of it until divested of the scarlatinal poison.

Unfortunately, the hands of the medical attendant are often tied by a combination of circumstances. It may be impracticable to effect removal of the patient. A case of scarlatina may actually coexist in the same house with a lying-in patient, and the removal of either may not come within the bounds of possibility; or, more frequently still,

the nurse or some of the patient's friends may have been brought into contact with cases of scarlatina, or the doctor himself may be in attendance on scarlatinal patients when called upon to minister to a lying-in woman. These may all undoubtedly prove active causes of infection. By untrapped and badly-constructed drains the poison may be actually laid on at the patient's bedside, or, through the medium of various articles of bedding and personal apparel, or even of food, an entrance may be effected to the lying-in chamber. Nothing but scrupulous attention to all and each of the various surroundings of the lying-in woman will guard against such dangers. Nor must the general hygiene of pregnancy be neglected, for a robust state of health undoubtedly offers a powerful resistance to infection.

It is rather to the influence of a third person as a vehicle of infection that I would now direct attention. Before proceeding, however, to discuss the means which may be adopted to shield our patients from the dangers arising in this manner, I would, at the expense of proving tedious, reiterate a point which has a practical bearing of no mean importance. Without denying the posssibility of direct inoculation through the parturient passages in exceptional instances, I have already pointed out that it is through the ordinary channels that the poison reaches the general system—that it is in fact taken in from the atmosphere. This point, which must necessarily influence the measures adopted with a view to insure immunity from infection, is apt to be overlooked.

It is now easy to comprehend how the nurse, midwife, or doctor, or, indeed, anyone brought into contact with the patient, as well as clothes and bedding, may serve as carriers of infection from a distance. It is, I admit, quite possible to conceive that the poison may be carried direct to the patient by the hand, or by some part of the clothing brought into direct contact with the genital passages, but it is far more likely to be lodged on the exposed surfaces of the body, and especially to become

entangled among the hair and deposited on the clothing, or it even may be inhaled, and, after transportation, is given off into the atmosphere. Setting aside the question of direct inoculation, it follows, then, that the longer the exposure to the scarlatinal case, and the greater the concentration of the poison, the greater the amount which will be absorbed and collected by the relieving vehicle, and that the longer the contact of such vehicle with the atmosphere of the lying-in room the greater will be the amount given off into it from the same source. On the other hand the greater the lapse of time between the visit paid to the scarlatina case and to the lying-in room, and the more freely the person is exposed to the fresh air in the interval, the less will be the amount of poison imparted to the atmosphere. Again, the more free the ventilation the greater will be the dilution of the poison-laden atmosphere. This attenuation of the poison not only renders the patient less liable to infection from it, but also prevents the vehicle from taking it up with readiness, and thus diminishes the chance of transportation.

From the above remarks it may be gathered that it is necessary, not only for the medical attendant, but equally so for all other persons who may have been brought into contact with scarlatina, and especially for the nurse, to observe strict precautions prior to attending on a lying-in woman, or even visiting a patient who is advanced in pregnancy. Now, what special means should be taken to free the person from infection? Careful washing and subsequent thorough disinfection of the hands with, say, sublimate (1 in 1000) or phenol solution (1 in 20), important as it is, is not sufficient in such cases. I would add—

(1) A disinfectant bath.

(2) A complete change of clothing.

(3) Active outdoor exercise.

To each of these I must add a few particulars. First, as regards the bath. The whole body should be immersed, and the head above all should be included, for the hair is a veritable network to entangle the poison. Whatever

disinfecting agent be employed, it should be of the greatest strength compatible with toleration by the skin. For my own part I prefer iodine, which rises in fumes from the heat of the water, and so may be inhaled at the same time. Exposure of the naked body to volatilized iodine answers the same purpose; the only precaution requisite is that the eyes should be kept shut during exposure to the fumes. The carbolic bath has the advantage over iodine of allowing soap to be used. Corrosive sublimate is difficult to deal with, for it is apt to deposit on the bath, and is readily decomposed by a small quantity of soap. As regards the clothes, a complete change should be made. Woollen articles may be disinfected by heat (most sanitary authorities are provided with a special apparatus), and all washable articles should be steeped in disinfectant solution before despatch to the laundry. Active outdoor exercise, such as a brisk walk, though less essential than the preceding, is of undoubted service in eliminating poison which may have been inhaled. The Turkish bath, when obtainable, is one of the best possible means of ridding the body of infection.

To sum up. It may be concluded finally that, as the poison may be carried, not only directly by the hands, but also indirectly by the clothes and general surface of the body, and possibly also by the breath, and subsequently given off into the atmosphere (from which it is inhaled by the patient), thorough washing and disinfection of the hands is not sufficient to ensure protection, but that a disinfectant bath, a complete change of clothing, and active outdoor exercise should be also included in the necessary precautions, and that these measures should be adopted not only by the doctor, but also by all other persons who have been brought into contact with scarlatina, and especially by the nurse, prior to attending on a lying-in woman, or even visiting a patient who is advanced in pregnancy.

Addendum.—Since the reading of this paper commenced an important contribution on scarlatina in lying-

in women by Dr. Henri Legendre has been brought to my notice. In this work, published in 1881, a good historical review of the subject up to that date is given. Several cases which came under the author's own observation are recorded, and will be found with others at the end of the volume. Legendre leaves untouched the question of incubation. The onset of scarlatina during pregnancy escapes with a bare mention. In dealing, however, with the clinical course of the disease, as it appears in the puerperal state, the author covers a wide field, for, after adverting in brief terms to the various eruptions which make their appearance in lying-in women, he reviews the subject after the manner of Guéniot, under the dual aspect of scarlatina and scarlatinoid. He contrasts the rash of scarlatina and its attendant manifestations with scarlatiniform eruptions, and the conditions found in association with them. A separate chapter is devoted to so-called septicæmic eruptions, among which the assumption of a scarlatiniform character is by no means uncommon. He draws the following conclusions:

(1) "Scarlatina is frequently irregular in its development, diagnosis is most difficult in masked cases, and rests only on the piecing together of certain immediate and remote symptoms (syndrômes).

(2) "Lying-in women are more liable to contract scarlatina than other eruptive fevers. In this condition, scarlatina very often deviates from the normal type.

(3) "Puerperal scarlatinoid and exanthems called scarlatiniform are *very likely* only unrecognised cases of scarlatina of irregular type.

(4) "Scarlatinal eruptions, even when of abnormal character, should not be confounded with septicæmic eruptions. The latter are the outcome of a serious general condition, usually fatal, and are the analogues of the eruptions of surgical septicæmia and of purulent infection.

(5) "On the occurrence of any exanthem analogous to that of scarlatina, supervening in a lying-in woman, it will

be prudent to submit the patient to such strict sanitary precautions as are called for in scarlatina."

The only observation which in this place I desire to offer refers to the distinction between scarlatina and scarlatinoid which Guéniot originally endeavoured to establish. Legendre very rightly maintains that the latter is only an attenuated form of the other. From the descriptions given, the two appear to merge imperceptibly one into the other. "The picture is almost the same, the shading only is different." "Scarlatina," he adds, "should remain one in spite of the different forms which it assumes. It is no more right to confound it with puerperal fever, which it complicates sometimes without in any way altering its character, than it is to divide it into two (scarlatina, scarlatinoid)." With this I am in entire accord. In the conclusion presented above, however, Legendre speaks less definitely, apparently because scarlatiniform eruptions (which are not necessarily of a true scarlatinal nature) are included in the same category. That certain of the scarlatinal manifestations undergo modification in the puerperal condition is on all hands admitted. But to apply to the disease, thus modified in its course the distinctive name "scarlatinoid" is to my mind a vexatious complication of an already difficult subject. If the disease in its clinical history (no matter to what extent and with what frequency individual symptoms undergo modification) corresponds in essential particulars to non-puerperal scarlatina (the individual types of which are notorious in their inconstancy), and in its etiological relations establishes this identity, let it be regarded for what it is—scarlatina in a lying-in woman.

Cases in which Scarlatina set in either during Pregnancy or Labour.

1. Dance. Archives Générales de Médecine, 1830, 1re Série, tome xxiii, p. 323, Case 1.

2. Cremen. Dublin Quarterly Journal of Medical Sciences, vol. xxxv, 1863, p. 484, Case 1.

3. Hervieux. L'Union Médicale, 1867, No. 123, p. 90, Case 5.

4. Hardy. Dublin Quarterly Journal of Medical Sciences, vol. xlvi, 1868, p. 330, Case 3.

5. Braxton Hicks. Puerperal Diseases. Obstetrical Transactions, 1871, p. 78, Case 8.

6. Ibid., p. 78, Case 9.

7. Ibid., p. 83, Case 20.

8. Swayne. Discussion on the Relation of Puerperal Fever to the Infectious Diseases and Pyæmia. Obstetrical Transactions, 1875, p. 155.

9. Koch. Obstetrical Journal, vol. iv, 1876–7, p. 222, Case 3 (quoted by Olshausen).

10. Legendre. Étude sur la Scarlatine chez les femmes en couches, p. 43, Case 1.

11. Jackson. Collective Investigation Record, vol. ii, p. 149, Case 70.

12. Leah. Boston Medical and Surgical Journal, 1884, p. 446.

13. Ibid. (quoted from Stiebel), p. 447.

14. Dwyer. Discussion on above, p. 448.

Dr. Dolan said his experience of twenty-two years' general practice with some 3435 confinements did not enable him to agree with the views on treatment at the conclusion of the paper. Those familiar with midwifery practice as carried on in the great bulk of the profession would agree with him that it was impossible to carry out the suggestions, as to bathing, changing of clothes and disinfection, laid down by Dr. Boxall. He sketched the routine life of a man in busy practice, and described the conditions of the houses of the working classes. Now, was it necessary to adopt such precautions? Looking at it from personal experience he found that, contrary to the generally received opinion, the puerperal women did not appear to contract scarlatina even though exposed to danger. He did not find that the practitioners in Halifax carried the infection, nor did he find it in his own practice. This was tested by the fact that the puerperal mortality, in spite of scarlatinal epidemics, was not higher. He gave some personal experiences. If

Dr. Boxall's view were true, the only way to meet the difficulty would be to have practitioners who only attended confinements and practitioners who only attended scarlatina. Experience declared this to be unnecessary even if it were practicable, and statistics confirmed his individual experience. He would not minimise the importance of the subject, and it was just as well there was this fear of scarlatina, but nevertheless, from a practical point of view, scarlatina was not so much to be dreaded. What he said was not in detraction of the able paper read.

Dr. PLAYFAIR said that everyone must feel how valuable a contribution to the science of obstetrics Dr. Boxall's paper constituted. There could be no question that henceforth his carefully observed facts and his elaborate tables would always be quoted when this subject was under discussion. The interesting point for the Society to consider was whether Dr. Boxall's conclusions bore out, or the reverse, the established views as to the influence of scarlet fever on the puerperium as they were laid down in our text-books on midwifery. He had held in his own work on midwifery that scarlet fever was a disease which might, under certain circumstances, be peculiarly dangerous to lying-in women, and, on the other hand, that it sometimes ran a perfectly normal course during childbirth, with all its symptoms typically developed, and with no undue severity. Further, it was held that the scarlet fever poison did not always breed true in the puerperal state, and that it might produce a severe form of disease, with some of the typical symptoms of scarlet fever, and practically indistinguishable from puerperal fever or septicæmia. Now, did Dr. Boxall's observations disprove these views? It appeared to him that he brought forward no facts which showed him to be wrong. In the first place it must not be forgotten that Dr. Boxall's cases were all placed in conditions under which the gravest effects of scarlet fever infecting a lying-in woman could hardly be looked for. If there was a place in the world in which antiseptic midwifery was carefully carried out it was the General Lying-in Hospital. In this atmosphere of perpetual antiseptic fumigations and irrigations the conditions were very different indeed from those attending the infection of a lying-in woman in the practice of a general practitioner who might perhaps have been visiting half-a-dozen scarlet fever cases in the morning, handling their desquamating skins and feeling their pulses, and then examining a lying-in woman in the afternoon, with perhaps no further precaution than a perfunctory washing of the hands. Yet even with all Dr. Boxall's protective battery of antiseptics, what were the conclusions at which he arrived? One of these is that "the disease may assume a masked form, in which the ordinary signs of scarlatina are absent, or so slight and

evanescent as to escape observation; and that in some such cases the only manifestation of the illness may be found in signs usually referred to septic poisoning." Is this not tantamount to the admission of the theory I have alluded to that scarlet fever in certain lying-in cases does not breed true? Again he tells us that in puerperal women there is "an enhanced liability to the disease," also that "angina and other characteristic symptoms are rare," also that "some modifying influence, the nature of which is unknown, is called into play at the time of delivery." If Dr. Boxall is obliged to admit all this in his antiseptic atmosphere, is there any reasonable ground for doubting its *a fortiori* action when no precautions are taken? Why the scarlet fever poison in a lying-in woman should sometimes produce a disease altogether different from scarlet fever, at others a typical scarlet fever, is a question very difficult to decide. He (Dr. Playfair) knew of no facts to explain it, but he had suggested a theory which seemed reasonable but was certainly not proved. This is that in the one case the poison is conveyed directly to the genital tract by the hands of the accoucheur or midwife, infected linen or sponges, or the like; while in the other the disease is contracted though the ordinary channels of infection. This, at least, would explain the great differences observed. There were many facts to show that other diseases besides scarlet fever were modified by the puerperal state. Some twenty-five years ago, before the days of antiseptics, either in midwifery or surgery, the authorities in King's College conceived the unhappy idea of founding a lying-in ward in the hospital. This was placed in the upper story above the surgical wards. The experiment was disastrous, and before long the mortality was so appalling that the lying-in ward was closed. While it was open, however, there were several outbreaks of erysipelas in the surgical wards. Coincident with these on every occasion an outbreak of puerperal fever occurred, but none of the patients had any symptoms of erysipelas, although some of the children were attacked with it. Is this not strictly analogous to the conduct of the scarlet fever poison contended for? As to the practical precautions to be taken, those recommended by Dr. Boxall, theoretically admirable though they were, were practically out of the question. Conceive the possibility of a hardworked general practitioner having to strip himself, expose his naked body to the fumes of iodine, plunge his head in carbolised water, and put on a new suit of clothes every time he saw a scarlet fever case. The thing is an impossibility. Fortunately much less will do, and Dr. Boxall's own experiences as to the effects of antiseptics as used in the General Lying-in Hospital will surely guide us in the right path.

Dr. Aust Lawrence (Clifton) stated that he had seen in

consultation six cases of undoubted scarlet fever occurring after delivery, and that four of them died. He considered that this disease was a very serious complication in puerperal women, and that it was most important to realise how scarlet fever affected the post-partum processes. He believed that some women did not die of the scarlet fever *per se*, but from decomposition of the lochia, &c., induced by the fever, and he instanced one case where the woman with scarlet fever post-partum was dying from absorption of septic lochia, and was saved by a timely washing out of the uterus and vagina with antiseptic solutions.

Dr. HERMAN agreed with Dr. Playfair in his estimate of the great value of Dr. Boxall's papers. But he did not follow Dr. Playfair in his opinion as to the conclusions to which the papers led. The paragraphs numbered 2 and 3 in the abstract of Dr. Boxall's sixth paper, which Dr. Playfair had spoken of as "facts," Dr. Herman thought represented only speculations. They were not based on Dr. Boxall's own observations, but only on his conjectures as to what might take place in circumstances different from those of the cases under his own care, and the only facts Dr. Boxall adduced in support of these speculations were facts not observed by himself but communicated to him by others. Dr. Herman thought these papers refuted, so far as a small number of cases could do so, the views of those who held that the scarlatinal poison could cause puerperal septicæmia, or a disease like or allied to it. These views, supported as they had been by Dr. Braxton Hicks, Dr. Playfair, and (in his report on the results obtained by the Collective Investigation Committee) Dr. Galabin, had been justly regarded as of great weight. But it appeared to him (Dr. Herman) that they were based simply on an imperfect process of exclusion. The evidence in support of them was composed of cases in which the investigator, meeting with a case of apparent septicæmia, sought for its cause. He failed to discover a source of septic infection, but found some way in which the patient had been exposed to the contagion of scarlet fever. Then, excluding septicæmia, he concluded that the disease must have arisen from the scarlet fever. Now, if it were possible for septic infection to have been conveyed to the patient in some way which had eluded the investigator's search, the whole argument broke down. And how could the possibility of septic infection be excluded? But Dr. Boxall's investigation was conducted in a different way, by a method so superior, that he thought Dr. Boxall's comparatively few cases outweighed the mass of imperfect evidence on the opposite side. Instead of starting with the case of disease and hunting back for the cause, Dr. Boxall began with the parent factors, the scarlet fever poison and the puerperal woman, of which, when brought together, he showed the result. That result was scarlet fever

and nothing else. This was the conclusion that Olshausen had reached. Dr. Boxall differed from Olshausen in that he did not find the disease so grave in lying-in women as Olshausen considered it to be. He (Dr. Herman) attached more weight to Boxall's paper than to Olshausen's for this reason, that Olshausen's paper was based chiefly on cases collected from other authors, and in some of the accounts quoted by him the possibility of the patient's having been affected by septic poison as well as by the scarlatinal had not been excluded. Thus of ten fatal cases of puerperal scarlatina quoted by Olshausen from McClintock, two died from metro-phlebitis and two from peritonitis. Dr. Boxall's papers, on the contrary, were based entirely on cases observed by himself. Dr. Playfair spoke of the fact that the cases occurred in a hospital in which antiseptic precautions were thoroughly and successfully carried out, as if it were a source of fallacy. He (Dr. Herman) thought it was the opposite: that the antiseptic precautions helped to exclude fallacy, and enabled Dr. Boxall to present a picture of scarlatina, pure and unmixed, in the lying-in woman. If Dr. Boxall had stopped with describing his cases of scarlet fever in the lying-in woman, he would have shown merely that scarlet fever produced scarlet fever, but would have left still possible the assertion that although scarlet fever produced scarlet fever in some lying-in women, yet in others it produced ailments that could not be recognised as scarlet fever. But the diagram showing the morbility in the hospital before, during, and after the prevalence of scarlet fever, which Dr. Boxall had added to his paper, showed clearly that it did not do any such thing; for the general morbility was not at all increased by the scarlatina. Dr. Boxall had thus shown that the poison of scarlet fever, when communicated to the lying-in woman, produced scarlet fever and nothing else.

Dr. Leith Napier said he had to express appreciation of the most interesting papers and tables furnished by Dr. Boxall. The most important question was,—Were all these cases scarlatinal? There were no doubt collective symptoms presented which could not well be shown in tabular form, but which justified Dr. Boxall in concluding that the cases were scarlatinal. The ordinary methods of establishing proof of scarlatina having existed were by observations relative to albuminuria and desquamation. Albuminuria could not, however, be regarded as a proof by itself as the kidneys of puerperal patients were not at all infrequently liable to shed albumen; and of the sixteen cases of scarlatina but eight were albuminuric. Desquamation in ordinary scarlatina was an invariable condition which occurred from the sixth to the twelfth day. Of the sixteen cases desquamation was well marked in seven; yet one case, X, in which the desquamation was very slight, not flaky but scaly, was unques-

tionably an excellent instance of scarlatina. With reference to the addendum to the paper, to which Dr. Leith Napier desired to refer in the first place, it was of great importance to recognise the varieties of rashes and conditions simulating puerperal scarlatina. Hervieux, in 'L'Union Médicale' for 1863, recorded twenty cases of scarlatiniform rashes. In this series there was intense fever; the rash did not appear on the face but affected the fore part of the thighs and body. Dr. Kidd read a paper to the Dublin Obstetrical Society in 1880 on erythema or roseola uterina in which he showed that this was a commoner affection than had been previously supposed; in it there was no kidney affection or desquamation or retardation in convalescence. Exceptional cases occurred in which there were minute vesicles scattered over the reddened surface; these dried up without becoming opaque or purulent, and cast off minute scales, especially at the angle of the jaws and exposed situations. In his paper Kidd referred to the condition described by Thomas in 'Ziemssen's Cyclopædia,' which the latter has named scarlatino-erythematous dermatitis. Thomas stated it to be quite distinct from scarlatina, and Kidd showed the clear distinctions between the affections he and Thomas respectively described. Dr. Napier had seen several such cases, and felt satisfied that if such symptoms arose in a patient exposed to scarlatina it would be best to regard them as probably infectious till the contrary was proved. Dr. Barnes, following Blundell's description, had described a miliary puerperal fever which might readily be confounded with scarlatinoid rash, The former was characterised by minute vesicles surrounded by narrow red rings of cuticle, first seen on the forehead, chest, and arms, then spreading over the body. The importance of determining the diagnosis must vastly affect prognosis, if it was true that, as was said by Dr. Sinclair, President of the Dublin Society, during the discussion on Dr. Kidd's paper, "we know very well that when scarlatina attacks a woman after labour it is nearly always fatal. Erythema occurring in connection with parturition has been frequently mistaken for scarlatina, and this would account for the asserted cases of recovery from scarlatina in connection with confinement." In Dr. Braxton Hicks' collection of eighty-nine cases of puerperal fever no less than thirty-seven were regarded as due to scarlatina; of these twenty-seven died. Dr. Barnes states, "if we can prevent scarlatina only we shall diminish puerperal cases by at least one half." Now, was this pessimistic view the right one or not? All Dr. Boxall's cases recovered, and giving every credit to his skill, care, and attention, and to the most excellent methods of the General Lying-In Hospital mentioned by Professor Playfair, Dr. Napier had difficulty in accepting the belief that scarlatina had no mortality in hospital and a death-rate so appallingly great in private practice, if the

conditions of the disease or if even the disease were one and the same. It might be admitted that the scarlatina in this epidemic was of the mildest type; or it might be suggested that cases occurring in private practice were only recorded when they died, never when recovery took place,—a hardly tenable theory with the tendencies of modern medical literature. He would desire to ask an explanation on this point, and suggested the possibility of the epidemic having been one of rötheln with certain undoubted cases of scarlatina intermingled. If this could be allowed it would be possible to reconcile the diverse observations and admit as fairly accurate the older views as to the gravity of scarlatina on the puerperium. Dr. Leith Napier's series of thirty-one cases of puerperal fever published in 1880 contained only one case in which any rash appeared; in it the predominant symptoms were metro-peritonitis on fourth day, a rubeolar-like rash on back, shoulders, arms, and abdomen on sixth day. Small vesicles appeared scattered through the rash; in three or four days more redness had disappeared. Patient eventually made a good recovery. In another series of cases, as yet unpublished, reported to the British Medical Investigation Committee on Metria, he had recorded one very clear example of rubeola in a puerperal patient. This case might be mentioned as a contrast to those of Dr. Boxall. Patient was confined on March 15th, 1880; easy labour; suffered from peritonitis on the 18th; temperature was 104°. On the 22nd all inflammatory symptoms were relieved, temperature 100·2°, pulse 84, but a rash precisely like measles appeared on the brow, chest, and freely all over the body. On the 23rd the temperature rose to 103·2°; patient died on eleventh day. It was afterwards ascertained that the nurse had just come from nursing a fatal case of measles. Most of the rashes Dr. Napier had seen were much more morbiliform than scarlatiniform. After all was said that could be said, a rash resembling scarlatina, measles, or erythema might appear in connection with traumatic toxæmia; rash was merely a symptom due to vaso-motor influences. He strongly felt that Dr. Boxall had properly stated that scarlatina was scarlatina and septicæmia septicæmia. There seemed to be a suggestion in certain records that the virus of scarlatina might remain in a latent form for weeks or months during pregnancy and that almost immediately after the pregnant woman became puerperal the disease showed itself. He could not accept this as proved. He believed that septicæmia *quoad* scarlatina, or, for that matter, any local or zymotic influence, was not a whit more grave, if as grave, as septicæmia developed without ascertainable cause. Diphtheria, in his experience, was a much more fatal complication than scarlatina. Referring to the question of symptoms, he observed that Dr. Boxall's cases differed from those of Dr. Hicks inasmuch as in the former the cervical glands were generally inflamed, in the

latter scarcely ever swollen or tender. He could not quite understand if the author contended that there was a special odour of the lochia in scarlatina? In his experience he had been unable to discriminate differences of smell in the diverse forms of metria; in cases of septicæmia, pyæmia, diphtheria, measles, scarlatina, he recognised a heavy fœtid smell but did not think it possible to differentiate further. As to treatment, he had no doubt that the indications were to maintain the strength and control the temperature. He thought, had the cases been more febrile, that antipyrin and wet packs would have been serviceable. The prophylaxis recommended was doubtless the ideal, and, so far as practicable, should be adopted, yet he agreed with previous speakers that such extreme attention was seldom likely to be absolutely necessary, perhaps still more seldom likely to be observed.

Dr. Braxton Hicks joined with previous speakers in expressing his sense of the value of the paper and of the evidence of good work it revealed; but he agreed with Dr. Herman that it did not prove more than that fifteen puerperal women with great care and skill passed through scarlatina without showing much more than the ordinary symptoms. But it did not explain those cases of which Dr. Hicks had seen many, where scarlatina existed in its proper form of great intensity till death; nor did it explain those cases where the symptoms of so-called puerperal fever came on shortly after delivery, and in a day or two the children in the house were attacked with scarlatina, which cases were not infrequent. With regard to the paper he had some years ago read before the Society to which previous speakers had alluded, he wished to point out that the title was "A Contribution to our Knowledge of Puerperal Diseases," derived from cases seen in consultation, in no way a record of private practice. He put it forth so that anyone who read it could form his own opinion. The method observed was of necessity not so perfect as was possible in the cases related in the paper just read. But if the Fellows of the Society would contribute all the cases which came before them we should be better able to judge on this subject, which, the speaker submitted, we were not now able to do with the present information. The connection of scarlatina and so-called puerperal fever did not fall within the proofs shown by this paper; the observations in it on the subject did not arise out of the cases, but from what the author had gathered elsewhere, and therefore with regard to the rash one was in this dilemma,—if scarlatina is subject to modification so that we might have no rash, and if septicæmia has often a rash scarcely if at all distinguishable from scarlatina, how are we to say what cases are one or the other? It might be open to anyone to say that the cases here narrated were not scarlatina at all. The speaker thought dis-

cussion on this point could not be carried out. Before we could satisfactorily do so we must collect more evidence, and particularly call in the assistance of those who studied bacterial questions.

Dr. MATTHEWS DUNCAN differed from an opinion implied or stated by speakers to-night that antiseptic treatment was also antiscarlatinal. Antiseptic treatment was aimed against the microbes of suppuration and septicæmia, not at the microbe of scarlatina. Dr. Boxall's experience showed very clearly that antiseptic treatment had no power of preventing the so-called scarlatina; for he had used antiseptics in all his hospital work in the most strict and admirable manner, yet he had a course of scarlatinal cases. He (Dr. Duncan) had long been disposed, by study and observation, to regard it as highly probable that in the so-called scarlatina of midwifery and of surgery there was more than one disease; and it was plain from the literature and from this evening's discussion that there were many difficulties in this matter and much difference of opinion. Among these difficulties, as bearing on the nature of the affection, he would signalise the different frequency in different sets of cases or countries, the vastly varying rates of mortality, the varying incubation, the frequent absence of angina, the occasional absence of desquamation, the rarity of communication. For himself, he regarded true scarlatina occurring within a few days of lying-in as a disease of enormous mortality, not as the mild disease seen in Dr. Boxall's excellent descriptions of what he had observed in a lying-in hospital. He would illustrate further the difficulties of the question by mentioning that a recent author (Hoffa) had proposed to restrict the "scarlatina of the operated on" to cases where the rash began at the wound. Lately a case of this kind occurred in his practice. A sinus of a chronic inguinal parametric suppuration was opened, and around the wound appeared a red rash, with fever, which spread over the body; there was no angina, and subsequent desquamation was scanty. When the eruption was well out Dr. Andrew regarded the case as only probably one of scarlatina. The same difficulty of diagnosis occurred in many cases of sporadic scarlatina. Dr. Matthews Duncan wished to add some remarks on the opinion of Dr. Braxton Hicks that scarlatinal poisoning was frequently and very injuriously commingled with puerperal fever or septicæmia, the scarlatinal element being latent or occult. With this hypothesis he had no sympathy. It ran counter to the general tenor of modern pathology. Dr. Boxall's experience, as now narrated, formed a very strong body of evidence against it. He had elsewhere ('Edin. Med. Journal,' March, 1876) shown by statistics that Hicks' view was quite untenable. It had been said to-night that if puerperal fever were deprived of the scarlatinal element it would be robbed of

half its danger. For this statement he knew no grounds. But if it were well founded, then increase of the scarlatinal element would increase the danger of puerperal fever. He had shown (in the plan referred to) that this was not the case. When scarlatina raged in London, killing 250 a week, there was no increase of puerperal fever. This grand statistical fact, and other considerations, lent some support to the practical considerations which Dr. Dolan had so well expressed. That gentleman's views demanded most careful study before we could enunciate strict rules of practice.

On the motion of Dr. GALABIN, seconded by Dr. HORROCKS, the discussion was adjourned (see p. 167).

APRIL 4TH, 1888.

JOHN WILLIAMS, M.D., President, in the Chair.

Present—43 Fellows and 7 Visitors.

Books were presented by Dr. Barnes, and the Academy of Medicine of Ireland.

Ernest Annacker, M.D. (Manchester); and Henry Briggs, M.B. (Liverpool), were declared admitted Fellows of the Society.

The following gentlemen were proposed for election:—Edward Tenison Collins, L.S.A. (Wednesbury); Henry Corby, B.A., M.D. (Cork); Isaac Rising Cory, L.R.C.P.Lond. (Guildford); Robert Dane, M.R.C.S.; Robert Brooks Popham, L.R.C.P. and S.Ed.; George A. Pratt, L.R.C.P.Lond.; and Frank Wyatt-Smith, M.B., B.C.Cantab. (Buenos Ayres).

THICK-WALLED CYST BEHIND THE UTERUS.

By C. J. CULLINGWORTH, M.D.

THE specimen being the subject of a communication which will be read at the May meeting of the Society, was referred to a Committee for report at that date (see p. 198).

Mr. DORAN observed that had not both ovaries been accounted for in Dr. Cullingworth's specimen he would have been disposed to believe that the tumour was ovarian and had burrowed

not only between the layers of the broad ligament but also under the posterior peritoneal investment of the uterus. He had seen that extreme condition twice during operation. Possibly the cyst in this case had its origin in the lymphatics, which, as Mierzejewsky and others had shown, were abundant in the connective tissue under the serous coat of the uterus.

Dr. CHAMPNEYS said that Dr. Cullingworth's statement that the fluid of the cyst was gelatinous was against the idea of a broad ligament cyst.

It was proposed by the President, "That Drs. Cullingworth and Horrocks and Mr. Doran do report on the specimen."

Report on a Specimen of Extra-uterine Gestation exhibited by Mr. Sidney Harvey, January 4th, 1888 (p. 2).

THE specimen consists of the enlarged uterus and the appendages. The uterus is five inches long, its walls greatly hypertrophied and in contact; the mucous membrane of the body is developed into a characteristic decidua.

Passing horizontally backwards from the uterine extremity of the right Fallopian tube is a ragged tear three inches in length, which leads into a cavity in the uterine wall filled with clot and placental tissue. This cavity has no recognisable connection with that of the uterus proper, but it is evidently the interstitial portion of the tube distended by the developing ovum of the third month which had been contained within it.

The right Fallopian tube is entire, and can be traced to the anterior margin of the opening, where it is lost. The round and ovarian ligaments of the right side arise from the side of the uterus external to the sac and one inch below the attachment of the Fallopian tube. Old adhesions unite the ovary and tube. The left ovary is also fixed to the uterus by old adhesions.

Microscopical examination of the transverse sections of the right tube shows the mucous membrane to be unin-

jured by previous disease, but there are several groups of mucous glands in the muscular wall, a very rare anomaly.

The specimen is one of gestation in the interstitial portion of the tube.

J. Braxton Hicks.
Sidney Harvey.
W. S. A. Griffith.

ADJOURNED DISCUSSION ON DR. BOXALL'S PAPER ON SCARLATINA DURING PREGNANCY AND THE PUERPERAL STATE (p. 163).

Dr. Galabin said that the author's cases were remarkable for the absence of mortality, but he did not think that it was a necessary inference that the general belief in the danger of puerperal scarlatina was incorrect. Of thirteen cases of undoubted scarlatina reported to the Collective Investigation Committee the mortality was about 31 per cent. These might not represent a fair average, but in McClintock's consecutive series of thirty-five cases during nine years at the Rotunda Hospital there were ten deaths. Dr. Herman wished to set these aside because some had septic symptoms, but this was begging the question. It might be that the special danger of puerperal scarlatina consisted in its liability to be complicated with septicæmia. The favourable result in Dr. Boxall's cases might be explained either as due to the excellent antiseptic precautions or to the mild type of the epidemic. It could not be assumed that the former was the sole reason, for long before the days of efficient antisepsis Brown had described a series of cases of puerperal scarlatina in Queen Charlotte's Lying-in Hospital without any mortality. The clinical aspect of the disease probably also had some relation to its mortality and the severity of its type. Dr. Boxall found few, if any, pelvic complications,

but of the cases reported to the Collective Investigation Committee in about half lochia were either scanty or fœtid, and the abdomen became distended in all that proved fatal. Dr. Galabin had seen two cases in which the patient appeared to be recovering from the scarlatina, when, in the stage of desquamation, peritonitis appeared and proved fatal.

The most interesting part of the subject was that embodied by the author in the third conclusion of his sixth paper, that in rare instances the disease may assume a masked form resembling septicæmia. Although he drew this conclusion it must be admitted that his paper furnished some of the strongest evidence which had yet been adduced against that common belief. Drs. Matthews Duncan and Herman argued that it disproved it, but Dr. Galabin considered that this was more than could justly be inferred, and that further evidence was required before this important question could be regarded as decided. The facts recorded could be equally well explained on two other suppositions, either that a masked form resembling septicæmia was only likely to arise from a severe and not from a mild type of scarlatina, or that it only occurred when the contagion was communicated to the genital canal, and therefore was prevented by antiseptic precautions. The only fair test would be to have a scarlatina of average severity, and no more antiseptic precautions than those commonly adopted in private practice. Dr. Matthews Duncan declared that perchloride of mercury was only an antidote to septicæmia and not to scarlatina. But the evidence was that perchloride of mercury destroyed all known microbes except the spores of bacilli, which would resist almost anything. The more probable explanation of the spread of the scarlatina was that no antiseptic can disinfect the air while allowing people to breathe in it, and that the scarlatinal infection is carried through the air.

There appeared to be a fascinating simplicity in arguing that scarlatina and septicæmia are two distinct specific diseases, and that therefore one cannot be con-

verted into the other. But the simplicity was only apparent. Septicæmia was not one disease but a group of diseases, comparable rather to all the zymotic diseases together than to scarlatina or erysipelas alone. Something like twenty different microbes had already been described as the active agent in different forms of septicæmia in men and animals. Septicæmia must be defined as including the effects of all microbes except those which are the agents in named zymotic diseases, and did not therefore constitute a definite entity like scarlatina. Moreover, mixed infections occurred, and, according to Cheyne, even in ordinary scarlatina the common microbes of suppuration were circulating in the blood in a large proportion of cases. These might easily find a nidus in damaged pelvic tissues.

The main evidence against the view that scarlatinal poison can produce a disease simulating puerperal septicæmia consisted in the charts published by Dr. Matthews Duncan in which he showed that, according to the Registrar-General's Reports for London, there was no increase of puerperal fever in proportion to that of scarlatina or erysipelas. He thought that this must be accepted as proving that scarlatina was not numerically an important cause of puerperal fever. But if it were only a comparatively real cause among many others, not accounting for more than 5 or 10 per cent. at the most of all cases, it would not be manifest in the charts. He was surprised that Dr. Matthews Duncan had not referred to erysipelas. This was a definite zymotic disease, having a definite microbe, which reproduced the disease after cultivation, and yet it was generally agreed that it had a very close relation to septicæmia, especially puerperal septicæmia, either by its own microbe or by promoting the growth of others. Dr. Longstaff had published charts drawn up on what seemed a better method, in which the ordinates of the curve represented not actual numbers but percentages above and below the mean. The curve of variation in different years for puerperal

fever was almost identical with that of erysipelas both in shape and magnitude. This could not be accounted for by direct contagion, but it suggested the idea that the microbe of erysipelas, which probably multiplied outside the body, might possibly be the commonest cause of puerperal fever.

The following reasons led him still to think it possible that scarlatinal poison might produce a disease simulating puerperal septicæmia. Even in the non-puerperal patient scarlatina might occur in a masked form without rash or marked sore-throat. In puerperal scarlatina the disease was generally somewhat modified. Although the mortality was above the average the sore-throat was almost always slight, and pelvic or peritoneal complications sometimes occurred. Cases also were not uncommon in which it was very difficult or even impossible to decide whether to class the disease as scarlatina or septicæmia. There was an evanescent scarlet rash not followed by desquamation, sometimes slight sore-throat, and local symptoms like those of septicæmia. Out of 354 cases of puerperal pyrexia reported to the Collective Investigation Committee there were eight or nine such cases compared with thirteen of undoubted scarlatina. The 354 cases having been classified, so far as possible, according to probable causation, it was found that in three classes the mortality was much above the average. There were cases in which pyrexia commenced before delivery, cases which occurred after exposure to infection of erysipelas, and cases which occurred after exposure to infection of scarlatina. In cases of actual evident scarlatina or erysipelas mortality was much less. This higher mortality appeared to be some evidence in favour of there being some causal link and not merely coincidence.

Dr. Horrocks said that the title of the paper indicated a wider scope than the mere relation between scarlatina and puerperal fever, though this might be the most interesting and important issue raised. Hitherto scar-

latina had been looked upon as a dangerous disease to bring into contact with a pregnant, parturient, or puerperal woman. Not only so, but when a woman was exposed to the infection of scarlatina, and developed symptoms of so-called puerperal fever, it had hitherto been supposed that the one was caused by the other. Now, the logical conclusion to be drawn from Dr. Boxall's cases appeared to be that when scarlatina attacked a woman it produced its ordinary effects and symptoms, whether she was pregnant or not, or parturient, or in the puerperal state. A study of cases clinically led to the conclusion that scarlatina, with its ordinary phenomena, was very rare in the lying-in woman. For instance, in the fifth report of the Guy's Hospital Lying-in Charity, embracing a period of twelve years, and including over 23,000 cases, scarlatina was only mentioned twice; in one case the patient had ordinary scarlet fever when six months pregnant; she miscarried but recovered. In the other case a child recovering from scarlatina was placed in the same bed with a woman just delivered; she died with symptoms of ordinary puerperal fever but not scarlatina. In the sixth report (not yet published), embracing a period of ten years, and including over 25,000 confinements, there were only three cases. In one the patient died on the third day from scarlet fever, having the rash; in the second case the patient had the fever with the rash, but recovered; in the third case a child with scarlet fever was in the same room, and on the fourth day the mother was ill with a high temperature, but soon recovered, and did not develop any rash. From these facts, and from experience gained in private practice, he argued that scarlet fever of the ordinary type was rare in the puerperal state, and he asked how many women were confined during the time that these sixteen cases were collected.

Secondly, he wished to point out that it might very fairly be said that some at least of the sixteen cases brought forward were not cases of scarlatina at all, and if they were they were very mild cases. For instance, in

Case I the tongue was normal throughout, there was no albumen, and the patient had had scarlatina before. In Case II the tongue was normal, the pulse steady, temperature 99·4°, the rash developed under a fomentation, and though there was albumen this had been present before the fever. In Case VIII the temperature was normal, and the pulse only 88. In Case IX the pulse was 80, the rash best marked under a fomentation, no albumen. In Case X temperature normal, pulse 80. In Case XVI tongue normal, no albumen, and no rash. But allowing that all the sixteen cases were instances of scarlatina, it must be admitted that many were of a mild type, and, indeed, they every one recovered. When scarlatina attacked non-pregnant individuals of a community or of a household, it was often found that whilst one or more suffered severely, some perhaps dying, yet others had the fever in varying degrees of severity or mildness. This he would refer to again.

In the first paper 2 (*d*) Dr. Boxall said "that when infection takes place during or shortly after labour, the incubation period may be shortened." Now, on looking at Table A it would be seen that the shortest interval after exposure was three days, and the longest thirty-one days. But three days were the ordinary incubation period of scarlatina, and it would be noticed that in the three cases where the time was so short as three days, the exposure to the fever was during and after labour, when it might be reasonably supposed the poison would get into the system and begin its action at once, whilst in the instance where thirty-one days elapsed the exposure was twenty-eight days before labour, from which one should infer, not that incubation lasted so long, but that the poison hung about the woman, so to speak, and only gained admittance to her system during or after the parturition. In other words, the incubation was not shortened when infection took place during labour, but inasmuch as, under such circumstances, the poison usually got into the system at once, the incubation began at

once, and so the fever developed within a few days after the exposure.

In the third paper Dr. Boxall observed that *during pregnancy* the throat symptoms were unmodified but that scarlatina after delivery caused little, if any, sore-throat. Now, as a matter of fact, scarlatina did not always cause throat symptoms in non-pregnant individuals, and out of the sixteen cases there were only three instances in which the fever came on before delivery (Cases VII, VIII, and XVI), and in these the throat symptoms were not very severe. Hence it would be premature to draw conclusions on this point.

In Table C it would be seen that in only three of the cases were malaise and lassitude present amongst the initial symptoms. Dr. Wilks, in his work on fevers, said this symptom (malaise) was always present. Again, only six had a furred tongue, and only three had anorexia; these facts tended to support the view already taken that the epidemic was a very mild one, and in arriving at any conclusions this fact must be borne in mind, because it had an important bearing upon the question of the clinical relation of scarlatina to puerperal fever. Now, there could be no doubt that this latter term included a group of diseases which might perhaps some day be disintegrated into its constituent elements. But the question now was, whether the poison of scarlatina in a puerperal patient could generate a disease indistinguishable from ordinary puerperal fever, and having no rash and no sore-throat. Dr. Boxall's cases, if they showed anything at all in this matter, proved that scarlatina always produced scarlatina in the pregnant and parturient woman, and yet in Paper VI, in the 3rd conclusion, he said that *in rare instances* the disease (scarlatina) might assume a masked form. This conclusion he must have drawn from sources other than those contained in the present paper. It did not appear to him that there was anything unreasonable in believing that scarlatina might cause puerperal fever, that is, one of the forms of this group of diseases;

for, in the first place, it was well known that scarlatina might kill a person without any rash appearing on the body, and the symptoms would be practically the same as those of certain cases of puerperal fever, even though the patient was not pregnant. An individual *plus* scarlatina would not necessarily present the same symptoms as that same individual *plus* the puerperal state, *plus* scarlatina. No doubt, scarlatina always tended to produce the same specific symptoms, whatever the condition of the patient, but the question was whether the puerperal condition did not sometimes prevent the manifestation of some symptoms such as the rash and sore-throat, and at the same time aggravate others, such as the fever and exhaustion. We did not know why a rash appeared in one person and not in another, but doubtless there was a reason for it. He believed firmly that some cases of puerperal fever were really instances of scarlatina in the puerperal woman. For, in addition to the reasons already mentioned, Dr. Braxton Hicks had collected a series of cases, and had found that in a large proportion, the patients suffering from puerperal fever had been exposed to the infection of scarlatina. Again, in the discussion which took place at this Society some years ago instances would be found of exposure to scarlet fever, followed by undoubted puerperal fever, without a rash or sore-throat, and ending fatally; persons in the same house having ordinary scarlatina. Frequently no other source of infection, except scarlatina, could be found to account for cases of puerperal fever. He quoted instances in his own practice.

Hence he would transpose the three conclusions given by Dr. Boxall in his sixth paper, and say that scarlatina generally produced in the puerpera a disease unlike ordinary scarlet fever, but resembling, and generally confounded with, other forms of puerperal fever, and that *in rare instances* scarlatina might produce in the puerpera a disease presenting, *for the most part*, the usual symptoms of scarlet fever.

Dr. Matthews Duncan had mentioned at the last

meeting that, according to the Registrar-General's returns, there was no corresponding increase in the number of puerperal fever cases during epidemics of scarlet fever. This was a most difficult point to surmount for those who believed that this zymotic disease could and did produce, at least one of the forms of puerperal fever, but he would offer as a partial explanation the fact that medical practitioners sometimes registered puerperal fever deaths as cases of scarlatina, when they knew, or thought they knew, that the patient had been exposed to that disease.

Dr. CAYLEY said that with regard to the question whether the poison of scarlatina was capable of directly causing septicæmia, he thought that no sufficient evidence had been adduced to render this view probable. At the London Fever Hospital they had had a considerable number of cases under treatment in which scarlatina had shown itself after operations performed at other hospitals, and also several cases in which operations had been performed in the Fever Hospital itself on patients suffering from scarlatina. In the past few years there had been two amputations of the thigh, one of the leg, besides several smaller operations, and for the most part the cases had done well and there had certainly been no increased tendency to septicæmia. His own opinion was that the two poisons were quite distinct, and that scarlatina was no more capable of directly producing septicæmia than septicæmia was of producing scarlatina, though of course a patient with scarlatina might very easily become septicæmic if he had a sloughing or ulcerated throat or suppurating glands.

With regard to the question whether scarlatina in the puerperal state presented special characters and ran a different course to what it did under ordinary conditions, his experience of these cases was too limited to enable him to express any decided opinion. Very few cases of puerperal scarlatina had been admitted into the Fever Hospital. In some of these the disease presented the ordinary characters; in two the patients presented the symptoms of an

acute septicæmia ; in both there was a petechial rash but no sore-throat, and he thought it was very doubtful whether they had scarlatina at all.

Dr. CHAMPNEYS said that Dr. Boxall's cases having occurred during the time that the President and he were Physicians to the General Lying-in Hospital, he thought the President would join with him in testifying to the great energy and acumen which he had displayed in their investigation. They were studied, not only while in the hospital, but Dr. Boxall himself hunted up their surroundings and antecedents, and pursued them on leaving the hospital with the eagerness of a foxhunter and the patience and skill of a detective.

He thought that Dr. Boxall had anticipated all or nearly all of the criticisms which had been made, and that his answers to them, by anticipation, would be found in his paper.

Among other things he plainly states that it contains the record and analysis of a series of cases which occurred in an epidemic. Now, although his series is the largest series yet observed, it is a series ; and while, on the one hand, it would be unfair to argue that the results represent the average mortality of scarlet fever under the circumstances of parturition, it would, on the other hand, be equally unfair to deduce such conclusions from a number of cases seen in consultation, which, by the very fact of consultation, are picked bad cases. To arrive at such facts, series should be compared with series.

After the generous acknowledgment of Dr. Braxton Hicks, criticism of his cases was somewhat disarmed, and yet it must be made. But the speaker hoped that he would not be considered rude if he raised a mild protest against receiving any final conclusions on the vexed question of " Scarlatina Puerperalis " from Collective Investigation reports. A large number of these had passed through his own hands, and, after carefully reading them, he was unable to derive any conclusions from them.

Written quite honestly, they were usually too meagre to be made use of; many of them were apparently not records made on the spot, but from memory, and they represented rather the various opinions formed by hundreds of men of different views than material for the settling of doubtful questions. For inquiries of this sort he believed them to be useless, and he should decline to entertain conclusions founded on them.

Dr. Hicks' cases were observed and recorded under great disadvantages, and while the puerperal fever element in them was generally plain, the scarlatinal element was often very doubtful, and it was questionable if in many of his cases death was due to scarlatina at all.

It must be quite plain to all in the room that the collected experience of them all amounted to very little; and, in this connection, the remarks of Dr. Cayley were of great value. Dr. Cayley, from his large experience at the Fever Hospital, gave us two facts, (1) that, in his experience, scarlet fever breeds true, and produces nothing but scarlet fever, and (2) that the cases sent up as "Scarlatina Puerperalis" to the Fever Hospital were usually septicæmia with a rash, and not scarlet fever at all. Does not this throw a strong light on much of the obscurity with which the subject has been surrounded?

One fact must be remembered in considering Dr. Braxton Hicks' cases, namely that they occurred before the days of antiseptics. Now, if it should turn out that, with the use of antiseptics, "Scarlatina Puerperalis" disappears, its name should disappear too, for it would turn out to be nothing but septicæmia. This is the direction of Dr. Boxall's series of cases, but one series will not settle the question finally, so as to convince the sceptical. Still, in finally settling the question, series should be compared with series, and not with cases seen and observed with unavoidable imperfection, still less with mere opinions.

Dr. JAMISON wished to express his agreement with Dr.

Boxall's conclusions. His experience of three epidemics of scarlet fever in districts which he knew well, and in which he could trace every birth during the epidemic, and by which midwife it was attended, was that scarlatina was very rare indeed in lying-in women, and only manifested itself as scarlet fever; that it invariably bred true; that it always followed the prevailing type of the epidemic, and was of itself rarely dangerous. Those grave cases with rashes were, in his opinion, not scarlatinal but septicæmic, and were allied in their origin to diphtheria, and occurred in the midst of insanitary surroundings. He thought the best diagnostic difference was to be found in the retina. Hæmorrhages into the retina were of almost constant occurrence in septicæmia, and were almost invariably absent in scarlet fever. His experience after the examination of many cases was that the scarlet fever poison rather avoided the eye; even in scarlatinal nephritis there was hardly ever any retinitis, and he would like to hear if the experience of other Fellows of the Society coincided with his own. He heartily concurred with every word uttered by Dr. Dolan, the first speaker in the debate, as to the impracticability of carrying out the very extreme precautions suggested by Dr. Boxall in the routine of ordinary practice. Happily he did not think them so very necessary. He had seen over and over again midwives attending labours who had washed scarlet fever children the same day, and who took no precautions save those of ordinary cleanliness, and he had often seen scarlatinal children in the same room with their mothers who were lying in, and yet no harm had arisen. These were clinical experiments forced upon us, and their inference was that scarlet fever was very rare in the puerperal state. He would like to see the practitioner presented to the Society who had undergone for a month a course of one or two daily antiseptic baths, especially if iodine were used with them, as had been suggested.

Dr. W. J. Collins said that to those who were imbued

with the notion that the virus of scarlatina was *ab æterno* and for ever absolutely and unalterably specific these cases of puerperal scarlatina would remain an inscrutable mystery; but to those that held that the *materies morbi* of the specific diseases was not outside the pale of evolution much of the mystery was explained. He regarded cases of puerperal scarlatina and surgical scarlatina as lowly specified diseases owning an ancestry in the common septic ferment, akin to traumatic fever and the sudoral exanthemata of Trousseau. Their occasional masked character and aberrant course illustrated Darwin's observation as to the greater plasticity of nascent species. He submitted that a disease like scarlatina, which owned such various origins, could not be allowed a high degree of specificity. Bacteriology did not help us much. The contagium of scarlatina was as yet unknown, and the only micro-organism which up to the present had been associated with it was one which was also present in erysipelas and in pus. In reply to the last speaker, he had seen retinal hæmorrhages and neuro-retinitis in puerperal septicæmia.

Dr. T. C. Hayes had never accepted the belief that scarlatina was productive of puerperal fever, and was glad to find that reliable evidence was being brought forward to show the distinctness of the two diseases. He had always taught that they were distinct. He had never seen scarlatina in a puerperal woman; but on three occasions in the King's College Maternity he had seen children suffering from scarlatina in the same room with their mothers who had just been confined, and in not one of these cases had the mother suffered from septicæmia or scarlatina. This went to show that puerperal women were not necessarily even susceptible to scarlatina. The clinical features of the two diseases were totally different. He held the same views in regard to smallpox, measles, and typhoid fever, which were supposed by many to give rise to puerperal fever. With rigid antiseptic precautions

one could approach a lying-in woman with perfect security, so far as conveying contagium was concerned.

Dr. WEST said that although it was many years since he had been engaged in that department of medical practice for the promotion of which the Obstetrical Society was founded, he yet thought that facts gathered from his own experience might serve towards the elucidation of the important questions which had been the subjects of this evening's discussion. He felt, too, that there was some risk lest supposed analogies with various processes of evolution should lead to the hasty adoption of opinions which ignored the specific character of various diseases, and saw in them merely accidental variations from the common original.

He had, when obstetric physician to the Finsbury Dispensary, afterwards when holding the same office, first at the Middlesex, and then at St. Bartholomew's, Hospital, seen much of puerperal fever in its different forms, and in different degrees of severity, but he had never seen a case which could be traced to the contagion of scarlatina, nor any in which the symptoms could be taken for those of that disease, and he thought that he might claim to be very familiar with the characters of scarlatina. He believed that the two diseases were essentially distinct.

There was, he thought, something in the condition of the pregnant, parturient, and puerperal woman which rendered her less susceptible than other persons to the influence of contagion, or, at any rate, to the contagion of scarlatina. He himself had seen but two cases, the one in a lady in the seventh month of pregnancy, in whom scarlatina with its characteristic rash and throat affection ran its ordinary course with moderate severity. The patient made a good recovery and pregnancy was not disturbed. The other case was that of a lady who was visited by some friends, in whose house there was scarlatina, just before her second confinement; labour passed off naturally, but on the third day she was attacked by scarlatina. The

rash was well marked and general, and there was distinct though not severe sore-throat. There were no symptoms whatever referable to the uterus, though he could not pretend to remember the condition of the lochial discharge. The mammary secretion was not established, but no symptoms of malignancy attended the fever. For two days the patient seemed to be doing well. On the third day she began to fail, and then in twenty-four hours more she died, life just passing away without any new symptom, either local or general, to which the sudden failure of vital power could be attributed. These two cases represent the whole of the speaker's personal experience of scarlatina in pregnancy or after delivery.

Dr. CHALMERS said that in connection with disturbances in the puerperal condition he had observed two things particularly, first, how often septicæmia in the lying-in woman was associated with, and apparently gave rise to a variety of pathological conditions amongst those in attendance; and, secondly, that where scarlet fever assailed the mother it never, according to his experience, ran its natural course. With regard to the first proposition, every doctor knows that sore-throat and malaise are common enough amongst nurses exposed to the puerperal poison. Besides frequent instances of infection observed, Dr. Chalmers had published a case of multiple septicæmia associated with, and seemingly giving rise to virulent pustule, erysipelas, violent and long-lasting urticaria, and phthisis, with a fatal issue. In regard to the second point, puerperal septicæmia was associated with so many different skin eruptions that attacks of scarlet fever might be so slight as to pass unnoticed except by those who watch the slightest indications, or might be so soon and so completely absorbed in the septicæmic condition as to be lost to the observer. He mentioned two cases where the rash was so slight, so evanescent, and so unaccompanied by any of the usual symptoms of scarlet fever that recognition was only possible through other

members of the family being within a few days seized with the fever in a marked form. In support of the view that scarlet fever may produce puerperal septicæmia, he related a case where, after a slight rash, followed in the sequel by several children being infected with undoubted scarlet fever, the mother rapidly developed undoubted septicæmia and died. Abandoning the idea of the absolute specificity of disease as untenable, and supported by the foregoing facts and by instances of scarlet fever occurring in lying-in women without apparent exposure to infection, Dr. Chalmers felt induced to believe that scarlet fever could produce ordinary septicæmia in the puerperium and could spring *de novo* from puerperal septicæmia.

The PRESIDENT said that in discussing the question it should be borne in mind that some epidemics of scarlet fever were characterised by mild forms of the disease, others by severe; that the infection from a mild case might give rise to the most malignant form, and that scarlet fever poison might give rise to septicæmia, but in a secondary manner.

In looking over the evidence bearing upon the relation of scarlet fever to puerperal fever which had been brought forward in the course of the discussion, there would be found on the one hand the cases published by Dr. Hicks, the cases collected by the Collective Investigation Committee, and individual cases adduced by several of the speakers who had taken part in the discussion; on the other the cases contained in Dr. Boxall's paper, together with cases adduced by other physicians, some practising and some not practising midwifery. The former cases were thought to favour the view that the poison of scarlet fever produced septicæmia in the lying-in woman; the latter to negative that view. The cases of Dr. Braxton Hicks were cases seen in consultation, most of them once only. They were seen under circumstances in which it was not possible for him to observe and follow them completely;

and on reading the reports of them as published in the 'Transactions' of the Society, it was not possible to come to the conclusion that they were cases of scarlet fever. The patients had at some period come into contact with scarlet fever, but this was not sufficient to show that the disease with which they suffered was scarlet fever. Many cases of precisely similar character were observed in which there was no suspicion of infection by scarlet fever poison. Moreover, there was no reason to doubt that Dr. Hicks' cases had also been exposed to septic infection, for they were observed at a time when antiseptic precautions were not in use. In none of them could septic infection be excluded. The cases of the Collective Investigation Committee were open to the same objection, and this rendered them absolutely unreliable as evidence of the production of septicæmia by the poison of scarlet fever.

The cases of Dr. Boxall, on the other hand, were observed throughout their course, and the most perfect precautions had been taken to exclude sepsis, and with complete success. In the course of an epidemic of scarlet fever in the south of London, the scarlet-fever poison had been several times introduced into the General Lying-in Hospital, where sepsis had been stamped out, had spread, but had in every instance bred true, and produced scarlet fever and not septicæmia. This was true of the severe as well as of the mild cases. We have here then two experiments on pregnant and lying-in women; in one the patients were exposed to septic poison and scarlet fever poison, and in these septicæmia was present in all, whether scarlet fever was present or not; in the other the women were exposed to the poison of scarlet fever alone, and scarlet fever alone resulted, septicæmia never. Since the reading of Dr. Boxall's papers, Leopold Meyer, of Copenhagen, has published a report of an outbreak of scarlet fever in the Lying-in Hospital in that town; and though twenty-one cases were attacked, yet they all ran the usual course of scarlet fever. In support of the view that scarlet fever poison produces septicæmia not a single case

had been brought forward in which this result had been brought about when the possibility of septic infection had been excluded.

Dr. BOXALL, in reply, desired to thank the Society for the attention bestowed upon his paper. On account of the protracted nature of the discussion he must ask the indulgence of individual speakers for replying in somewhat general terms to the valuable remarks which had been called forth. In doing so he would adhere as closely as possible to the plan of the paper. First as regards the diagnosis of the sixteen cases of scarlatina. The diagnosis was substantiated by the visiting physicians, and also (in those cases transferred to Stockwell) by the Medical Officer of the parish and by the authorities of the Metropolitan Asylums Board. Further confirmation could scarcely be desired. Dr. Braxton Hicks has suggested that with reference to the rash "it might be open to anyone to say that the cases narrated were not scarlatina at all." Certainly that is so, but the diagnosis of the cases brought forward in the paper was founded, as in all cases of scarlatina it ought to be founded, not on the rash alone but on a definite chain of phenomena in which the rash formed but one connecting link. In many other cases an eruption was observed, and in a few the rash presented a scarlatiniform appearance, but such cases were not regarded as scarlatina. Reverting now to the question of the liability of pregnant and parturient women to scarlatinal infection, it seemed that women of the same age were more prone to scarlatina than in the non-puerperal condition, though perhaps not to such an extent as he had been led to believe prior to this discussion. Numerous cases could be cited in which puerperæ had been exposed to the scarlatinal poison with impunity. He had in his paper cited forty such cases in hospital; on the other hand four, and possibly six, took the disease. Many other instances of escape could be mentioned; one, which occurred some years ago but is for obvious reasons

specially impressed upon his memory, would suffice. When Obstetric Assistant at University College Hospital he visited a recently delivered mother; three of her children were down in the same room with scarlatina. The woman escaped, but he himself took scarlet fever, and for over six weeks was an inmate in the London Fever Hospital, an experience which contributed materially to the elaboration of the present paper.

In his paper he had said that he was not prepared absolutely to deny a prolonged incubation to scarlatina in the pregnant state, because he thought it possible that some evidence might be forthcoming in support of that hypothesis. In this, however, he had been disappointed. Olshausen ('Obst. Journ.,' vol. iv, p. 367) says all that can be said in favour of it, and bases his conclusions on certain of the cases related by Dr. Braxton Hicks, and on a few others which are open to the same objection. To date an incubation period from the commencement of exposure is to commit a *post hoc* fallacy, and this is exactly the error into which the advocates of a prolonged incubation period have fallen. The following is a case in point. Three children in one family, to which infection was traced in Cases IV, V, and VI, failed at intervals of six weeks, so that the disease had been at least twelve weeks in the house before the last failed. Was the incubation period in that case of twelve weeks' duration? The evidence afforded by Dr. Braxton Hicks' cases in favour of a prolonged incubation during pregnancy is of precisely the same incomplete character. "A pregnant woman had nursed her children in scarlatina a month before delivery. She fell ill on the second day after delivery and recovered. Another pregnant woman nursed her children two months before delivery. She fell ill on the third day after delivery, and died on the fifteenth day. Two others had nursed their children in scarlatina, one ten days, the other several weeks previously, and both fell ill within the first few days after delivery. The children of another, who was attacked on the third day after delivery,

had two months before suffered from slight fever with a scarlatina-like rash." "These cases," says Olshausen, "are well adapted to support the hypothesis of the prolonged incubation." Is it on such evidence as this that he is led to base *the fact!* that in most cases no opportunity of infection could be demonstrated within quite the last period of pregnancy? Dr. Boxall had searched in vain for any case in which a pregnant woman had been exposed to scarlatina, and subsequently isolation or disinfection had been carried out so as to eliminate the possibility of infection just before, during, or even after delivery. The same remark applies to those cases where children and others are attacked after the mother has been delivered. As all these women appear to have been confined at home in the same empoisoned atmosphere, and with the same surrounding conditions, infection is as likely to have occurred just before, at, or even subsequent to delivery for all the evidence which such cases afford. On the other hand, Hervieux, who like himself has noted the occasional precipitation of labour by the scarlatinal poison, speaks in favour of an unusually short incubation in *puerperal* women. Olshausen, however, in passing criticism upon this, entirely ignores Hervieux' definite statement that the epidemic observed by him was "an entirely local epidemic, quite special to the maternity;" from which Hervieux himself draws the conclusion that it was in the institution itself that the lying-in women took the scarlatinal poison, and, further, that, as most of the women were in labour at the time of their admission, and usually failed within twenty-four to forty-eight hours after, the period of incubation had a very short duration. Senn, one of his predecessors at the Paris Maternity, observed the same fact in 1824. In the cases brought forward in the paper, the patients were also removed to hospital when taken in labour, so that an entire change of conditions (even to the personal clothing) was effected, and on this account many of them are peculiarly adapted to furnish evidence of a *complete* character with regard to

the period of incubation, more especially as in some cases the exact period of exposure could be determined. This evidence lends no support whatever to the theory of prolonged incubation, but is on the other hand in favour, if anything, of an abnormally short incubation period when infection occurs at or subsequent to delivery.

With reference to the severity of scarlatina in the puerperal state, Dr. Boxall explained that he was disposed to regard the Collective Investigation as a record of unusually severe cases from the fact that the mortality of the whole number of pyrexia cases is given as 47·4 per cent. This would indicate that nearly every other woman dies who has any fever from any cause in the puerperal state. But when the slight as well as the severe cases are taken together as in his morbility tables, the mortality of the pyrexia cases is found to be less than ·9 per cent. *i. e.* not one fiftieth part of that given by the Collective Investigation Record. It is incredible that the results obtained at the General Lying-in Hospital should be so far superior to those of general practice. On the other hand, Dr. Boxall fully recognised the fact that the cases of scarlatina which he had related in the paper were of mild type; one case only (Case III) was of a serious nature. Other cases of great severity had, however, come under his own observation. At the end of 1884, during this very same epidemic, he was called to see a lady in private who had failed with a sharp attack of scarlet fever three or four days after the birth of her first child. On the fifth day after delivery, when he saw her, the usual scarlatinal manifestations were present; the abdomen was tender, the bladder much distended and overflowing, the bowels had not been relieved, the lochia were decidedly foul, a state of affairs which neither the nurse (who was most inefficient) nor the medical attendant (who was confined to the house by illness) had sought to remedy. The child escaped. Several cases of scarlatina existed in the same street. Under the influence of more favourable surroundings the patient began to improve, and

regained consciousness, but sank on the tenth day after delivery. Whether death was in this case due entirely to the severity of the scarlatinal attack he could not say. In another case of severe scarlatina following delivery, the severity of the attack was apparently exhausted, and the temperature had gradually declined to normal, but the lochia became offensive, and on the tenth day after delivery parametritis set in, the temperature again rose and three days later reached 108°, death occurring the same evening. The fatal result in this case was evidently brought about by the secondary affection. The infant escaped.

Two other cases occurred about the same time which were connected together by a distinct link as regards infection. In one the attack was severe, and the patient died on the ninth day after labour (but whether from scarlatina or septicæmia is uncertain); in the other the illness was slight, and the patient recovered. Both children are supposed to have taken it. In none of the above cases were local antiseptic measures employed with a view to prevent septic infection. Within the last year, again, a mild, uncomplicated case of scarlatina had come under his care at the General Lying-in Hospital. The infant escaped, and no detrimental effect was observed in the two cases lying in the same ward. Now, why this difference in intensity? Dr. Playfair suggests, and Dr. Galabin has propounded the same idea, that the more serious cases, the cases of a masked character, may be the result of direct inoculation, in contradistinction to mild typical cases in which the poison enters by the usual channels. Dr. Boxall has hunted up numerous cases which have a bearing on this, and can find no evidence whatever in support of such hypothesis. Those cases in which from the history the attendant may be looked upon as the possible vehicle of infection for the *scarlatinal* poison are of no greater severity than others in which direct inoculation seems unlikely. Indeed, some of the very worst cases are those in which direct inoculation may

be entirely eliminated, for the patients had evidently received infection prior to the onset of labour. Dr. Matthews Duncan suggests the possibility of two separate diseases, but though much may certainly be urged in favour of this, Dr. Boxall was equally at a loss to accept this explanation in full, for every gradation of intensity is met with, even when identical exposure has taken place (compare Cases I and III). Similar anomalies exist in ordinary scarlatina, and until an explanation can be found why in the same epidemic some cases are mild, others severe,—one member of a family or one boy in a school may be struck down at the very outset or take the disease in a malignant form, or perhaps one or more whole families may be affected in the same way, while others take it very lightly or perhaps escape entirely,—until such anomalies are cleared up, little probability exists of finding a satisfactory explanation for the anomalies which occur in scarlatina when associated with the puerperal condition. In non-puerperal scarlatina such severity has never yet been traced to direct inoculation, nor can the whole explanation be found in two separate diseases, unless indeed the poison of both go hand in hand in the same epidemic and the virus of one be readily transmutable into that of the other. Therefore, putting aside cases complicated by septicæmia, the explanation must, it seems, be sought in some at present undetermined variation in the conditions inherent to the individual attacked, conditions which exert a direct influence on the potency of the scarlatinal poison.

Dr. Boxall pointed out that the conclusions offered in the sixth section should be read in conjunction with the three propositions referred to in the introductory part of his paper. In the first five sections several side issues had been disposed of chiefly by the aid of the cases now brought forward, but when in the sixth section he came to review the whole question and to offer a criticism on the above-mentioned propositions, in which is embodied the main contention—the relation of scarlatina to septi-

cæmia in the puerperal state—he drew not only on his experience of these cases, eked out by several others which he had himself observed, but also took into consideration a number of authentic cases reported by others, reference to most of which may be found in the authorities quoted. This became a necessity, for certain of these propositions had been put forward with no basis of support beyond the evidence afforded by these heterogeneous cases; but to have included a description of them in the paper would have rendered it of inordinate length. The nature of this evidence has, however, been freely spoken of.

In the paper, a picture of scarlatina pure and simple, the septic element being eliminated, was presented to the Society. That other picture of scarlatina *plus* septicæmia in which the septic element could not be eliminated, had been so frequently portrayed by others, that he forbore even to relate the cases of that description which had come under his own observation. In the first picture, the true likeness is apparent; in the second, the individual image, as in a composite photograph, is blurred and obscured. With regard to the conclusions offered in the sixth section he had nothing to detract from and nothing to add to what he had already said, except to emphasize the fact that the *direct* effect of scarlatinal poison is the production of scarlatina and not septicæmia in lying-in-women. At the same time he was fully aware that scarlatina, like all fevers, and especially the blood diseases, is apt to favour the onset of septicæmia *at a subsequent stage*. This is in fact only in conformity with the behaviour of scarlatina apart from the puerperal condition. That septicæmia may be associated with scarlatina in the early stages he would not deny, for such a contention, if followed to a logical conclusion, would ascribe to the scarlatinal attack a protective influence against one of the more common accidents to which puerperæ are liable; but that such association is none other than accidental is fully borne out by the fact that when the septic element

is eliminated, scarlatina and not septicæmia results. The precise observations of Dr. Matthews Duncan with regard to epidemics were conducted on an extended scale; his own shed a ray which was, so to speak, concentrated and brought to a focus; but both agreed in illustrating the fact that the scarlatinal poison does not in itself produce septicæmia. Dr. Cayley also, speaking from an extensive experience of scarlatina, has expressed an emphatic opinion upon this point. Whether the cases are masked or not can make no difference, they still remain cases of scarlatina, and the same remarks apply with equal force.

That masked cases should sometimes occur in the puerperal state is less a matter for surprise than their recognised incidence apart from the puerperal condition. The contention of Dr. Playfair that the modification of individual scarlatinal manifestation is contingent on the antiseptic treatment of the puerperal state rather than on that state itself, is entirely disproved by the fact that in cases in which no antiseptics have been used similar modifications have been shown to exist. This modification (not absence) of individual symptoms, however, does not amount to masking. Nevertheless, as the result of intercurrent disease masked cases do sometimes occur in the puerperal as in the non-puerperal state, but for such he must refer Dr. Playfair to the cases which constitute the second picture. In the cases brought forward in the paper, septicæmia, *the* masking influence of the puerperal state, was eliminated, and hence the difference. But, whether masked or not, scarlatina breeds true, and in itself no more produces septicæmia in the puerperal than in the non-puerperal condition.

The chief aim of the last section, which deals with preventive treatment, was to combat the idea that disinfection of the hands is the one essential precaution, and that measures which are generally regarded as necessary to prevent the spread of scarlatina to other people are less essential in the case of pregnant and parturient women. This idea is erroneously founded on the assumption that

the genital tract practically holds a monopoly for the ingress of the scarlatinal poison (direct inoculation). Once divest the question of this assumption, and the part likely to be played by the medical attendant as a vehicle of infection sinks into insignificance in comparison with others brought into contact with the lying-in-woman. Though the precautions recommended in the paper are open to criticism on the score of idealism, they are such as Dr. Boxall had consistently carried out in practice, and though fully aware that their adoption *in toto* in every case is impracticable, they had been put forward by him as embodying the correct principles of treatment. In the paper the subject had been dealt with chiefly from a clinical standpoint. The bacterial question, to which reference has been made, was purposely omitted, for when once put forward germs and organisms are apt to absorb the whole discussion and to baulk the consideration of facts from any standpoint other than that provided by their own at present unstable basis. The time, however, seems at hand when certain knowledge may be looked for. When the exact relation of different organisms to scarlatina and to septic diseases has been worked out, a key will doubtless be found to the explanation of facts which clinical experience already teaches, but as long as the very germs themselves are, so to speak, on probation we must be content to omit the bacterial question from any discussion on the relation of scarlatina to septicæmia in the puerperal state.

MAY 2ND, 1888.

JOHN WILLIAMS, M.D., President, in the Chair.

Present—30 Fellows and 2 Visitors.

Books were presented by Dr. Ahlfeld, the Council of University College, and la Société Obstétricale et Gynécologique de Paris.

Peter Cooper, L.R.C.P.Lond (Blackheath); and Thomas Babington Grimsdale, B.A., M.B.Cantab (Liverpool), were declared admitted Fellows of the Society.

The following gentlemen were elected Fellows:—Edw. Tenison Collins, L.S.A. (Wednesbury); Henry Corby, B.A., M.D. (Cork); Isaac Rising Cory, L.R.C.P.Lond. (Shere); Robert Dane, M.R.C.S.; Robert Brooks Popham, L.R.C.P. and S.Ed.; George A. Pratt, L.R.C.P.Lond.; and Frank Wyatt-Smith, M.B., B.C.Cantab. (Buenos Ayres).

The following gentlemen were proposed for election:—William Steer Riding, M.D.Ed.; and Joseph Theophilus Weston, L.K.Q.C.P. and L.M. (Tirhút).

GLANDULAR STRUCTURE IN THE SUBSTANCE OF A PRIMARY CANCER OF THE FALLOPIAN TUBE.

By Alban Doran.

The diseased tube and sections of the new growth and of the secondary deposit in the ovary had already been exhibited at a meeting of the Pathological Society on Tuesday, May 1st. The microscopical preparation brought forward this evening bore an important relation to the subject of Professor Sutton's contribution on "The Glands of the Fallopian Tubes and their Function." In the midst of a cancerous mass a large tubular structure was seen, divided transversely. Mr. Doran was of opinion that not only did glandular structures exist in the mucous membrane of the Fallopian tube, in our species, but that also those structures might be the origin of primary cancer, as this preparation appeared to prove.

Dr. Lewers said that, so far as he had followed the account given of the specimen, it seemed quite possible that the disease of the Fallopian tube was secondary to cancer of the body of the uterus. Dr. Lewers asked (1) What was the structure of the papillomatous masses scraped from the endometrium by Dr. Routh? and (2) What was the condition of the tube, as far as it could be ascertained by physical examination at the time of the scraping?

Dr. Amand Routh stated that, finding shreds of papillomatous material coming away with the sero-sanguinolent fluid, he dilated and curetted the uterus, bringing away much similar material, and believed that he had cured the patient. Four weeks afterwards, the watery discharge having temporarily ceased, the patient had an attack of acute perimetritis, and as this passed off, a small mobile tumour was found in the right broad ligament region. There was no permanent diminution of the discharge, and the tumour gradually grew till it was removed fourteen months afterwards by Mr. Thornton.

Dr. Horrocks did not think sufficient evidence had been brought to prove that the cancer was primarily tubal and not ovarian. He asked what differences were shown in the histo-

logical sections of the growths in the ovary and Fallopian tube respectively.

Dr. GRIFFITH said that the presence of glandular and duct-like structures was so common an occurrence in cancerous growths that he could not agree with Mr. Doran that his very interesting specimen afforded evidence of the view that the mucous membrane of the tubes was glandular, or that the disease necessarily originated in glandular structures.

In reply to the observations which had been made by Drs. Lewers, Routh, and Horrocks, Mr. DORAN stated that the history of the case and the reasons which led him to believe that the growths in the tube were primary, had already been discussed at great length in the contribution which he had recently submitted to the Pathological Society. Dr. Griffith had noted, this evening, the fact that tubular structures were commonly seen in cancers; Mr. Doran was well aware of that fact, but added that the tubules were developed more or less directly from normal pre-existing tubules, such, he believed, being especially the case in the specimen which he now exhibited, where the cancerous elements were arranged as in carcinoma of structures evidently glandular, like the breast, and not, as in cancer of free mucous surfaces elsewhere.

A MICROSCOPICAL SECTION OF TUBE FROM AN EARLY TUBAL FŒTATION.

By A. L. GALABIN, M.D.

MICROSCOPICAL SECTIONS OF A FALLOPIAN TUBE SHOWING GLANDS.

By W. S. A. GRIFFITH, M.B.

DR. GRIFFITH exhibited microscopical sections of a Fallopian tube from a case of interstitial extra-uterine gestation. At the uterine end of the tube there were numerous mucous follicles in the muscular wall lined by small columnar cells. True glands are apparently very rarely found in the human Fallopian tube.

MICROSCOPICAL SECTIONS OF THE OVIDUCT OF THE FROG.

By W. S. A. Griffith, M.B.

The oviduct of a frog at this time of year becomes much developed. The mucous membrane consists of simple tubular glands closely packed and resting on an external membrane of delicate connective tissue.

IRREDUCIBLE INVERTED UTERUS WITH A FIBROMYOMA REMOVED BY AMPUTATION.

Exhibited by P. Horrocks, M.D.

The patient from whom this specimen was removed is a woman 45 years of age, whose last child was born ten years ago. Her monthly periods were regular up to twelve months ago, since which time she has been losing almost constantly. The bleeding commenced whilst she was nursing her husband, who died about a year since. In addition to the hæmorrhage she complained of bearing-down pain. On examination, a pear-shaped mass was found in the vagina which was thought to be a polypus. It was impossible to reach the cervix uteri, and so chloroform was given and a more complete examination made, when it was found to be an inverted uterus. The inversion was complete except about half an inch of the cervix. Aveling's repositor was applied, but the cup was too small, and consequently it slipped between the tumour and the anterior vaginal wall, with the result that the inversion became absolutely complete. A special cup was then made and the repositor applied again. Steady pressure was thus exerted in the direction desired for upwards of a week but without success. The instrument had to be removed now and then for several hours on account of the pain it produced. Chloroform was again administered and taxis was tried, but in vain. Other plans were also adopted with similar want of success. It was impossible

to tell whether there was a fibromyoma attached to the fundus, although this was suspected. Attempts to examine the tumour by pulling it down were attended by sharp hæmorrhage. The patient was weak and anæmic, and so it was decided to abandon further trials and proceed with amputation. This was accomplished by transfixing the vaginal walls just where they become continuous with the inverted os externum and then tying each half separately. A separate ligature was tied round the whole pedicle at the same spot and then the uterus was cut off. One or two large vessels had to be separately tied. In another case I should be inclined to tie a ligature round the whole of the pedicle, then to cut down to the peritoneum all the way round, and tie a second ligature round this unopened peritoneum before cutting completely through it.

Upon making a section of the part amputated one finds it to consist of a completely inverted uterus with a fibromyoma attached to the fundus. The union between the two is so intimate that it would have been impossible to separate them even if the fibromyoma had been diagnosed. The patient is doing well.

Dr. AMAND ROUTH mentioned a case in the practice of another gynæcologist where an egg-shaped polypus had been removed by the wire écraseur, and in a few days' time, on further examination, a long, finger-shaped body was found filling the uterus, which was two and three quarter inches long, and reached to the external os. The patient was very carefully examined under chloroform, and the question as to whether any portion of the polypoid mass was inverted fundus fully investigated. No evidence of this was found, and the wire was again applied, the piece removed proving to be the stump of the broad pedicle of the original polypus, together with the inverted right cornu of the uterus with part of the right Fallopian tube and round ligament. The patient recovered without pyrexia, and is now well, but has not menstruated since.

Dr. HORROCKS, in reply to Dr. Galabin, said no adhesions were found to explain why it was impossible to restore the inverted uterus.

The specimen was referred to a committee consisting of Mr. Doran and Dr. Horrocks.

THE INVALID'S COMPENDIUM.

Exhibited by Dr. Graily Hewitt for Miss Browne.

THE ALPHA CONSTANT-CURRENT SYRINGE

Exhibited by the Senior Secretary for Dr. James Armstrong (Liverpool).

DR. AUVARD'S NIPPLE SHIELD.

Exhibited by Dr. Godson.

REMARKS DESCRIPTIVE OF SPECIMEN SHOWN AT APRIL MEETING (p. 165).

By C. J. Cullingworth, M.D.

The specimen laid on the table consists of the uterus and annexa of a young married woman, aged 23, who was a patient under my care at St. Mary's Hospital, Manchester. As I shall have an opportunity of giving the clinical history of the case in a short paper which is to follow, I will now only call your attention to one or two points in connection with the specimen itself. Behind the uterus, and extending above and to each side of it, is the large cyst already described. The connection is so close that it is difficult to conceive of it as being due to simple inflammatory adhesion. Indeed, although I have not been able to find anything of the kind described, and have no theory to offer as to its mode of production, I am disposed to regard

the cyst as having originated in the tissues of the posterior wall of the uterus. It is not ovarian, for one ovary was removed during life and the other is here in its entirety. Neither is it the sac of a tubal gestation (the possibility of which was naturally one's first thought), for its cavity has no communication with either tube, and indeed both tubes are normal except that the left, being put on the stretch by the cyst, is elongated and distorted. Moreover, no fœtal remains were found in the cyst, and no decidua in the cavity of the uterus.

The case, as may be imagined, was a puzzle to me during the patient's life, and is scarcely less so now that I have the parts before me. Should the specimen be deemed interesting enough to justify the appointment of a small committee to examine and report upon it at a future meeting, I need not say it will give me great pleasure to leave the preparation in their hands, and to assist them in obtaining any further information they may think desirable.

Report on Dr. Cullingworth's Specimen of Thick-walled Cyst behind the Uterus.

Bladder.—Muscular coat rather thick. Mucous membrane and serous coat healthy. No adhesions between the layers of the vesico-uterine pouch.

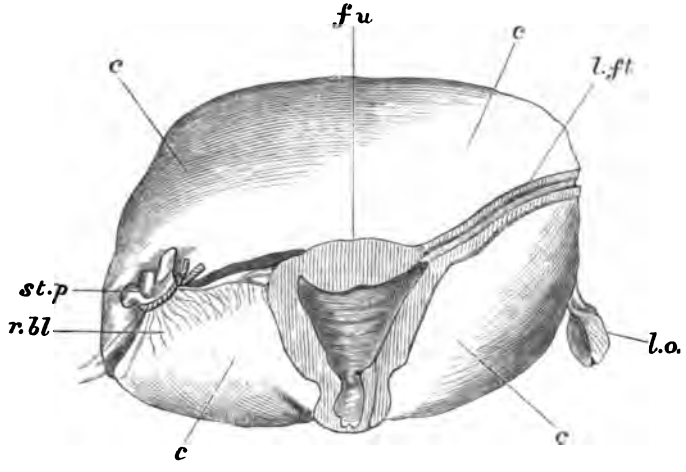
Vagina wide; rugæ fairly marked.

Uterus.—Cavity 2¼ inches, canal of cervix 1½ inches; portio vaginalis ill developed. Walls ¾ inch thick, midway between fundus and os internum. No visible interstitial fibroids nor dilated sinuses. Endometrium smooth.

Stump of pedicle (*st. p*) of right appendages secured with stout silk; not capped with clot. Anteriorly and externally lymph has been thrown out across the groove formed by the silk. For a short distance below the

stump, the right broad ligament (*r. bl*) is normal; inferiorly the cyst has forced itself between its layers.

Left ovary (*l. o.*) forms an appendage to the back of the cyst, somewhat anteriorly. It is flattened, and measures about 1½ inches in long diameter; a few small follicles and an old corpus luteum lie near its surface. The ovarian ligament, over 1½ inches in length, is lost on the surface of the cyst wall, and cannot be traced to the uterus. The fimbriæ of the left tube, stretched and somewhat atrophied, lie near the ovary closely adherent to the cyst wall at a point where the latter has been cut across.



Viewed from in front.

Cyst.—A large thick-walled cyst (*C. C. C. C.*), unilocular and about 5 inches in its long or horizontal diameter when flaccid, lies behind the uterus. It appears to form the posterior wall of the uterus from the fundus (*f u*, closely incorporated with the anterior wall of the cyst) to the cervix. The left Fallopian tube (*l. ft*) runs in its anterior wall to the left and downwards, and is cut across, by an incision made in the back of the cyst, close to its fimbriated extremity. The rectum is adherent to the

posterior wall of the cyst. The anterior layer of Douglas's pouch passes behind the cyst, but the two layers are united by adhesions which bind together the rectum and the cyst.

The cyst has completely separated the folds of the left broad ligament, and burrows, to the right of the median line, into the lower part of the right broad ligament (*r. b. l.*).

The lining membrane of the cyst is deeply wrinkled anteriorly and to the left, and almost smooth posteriorly. Almost opposite the point where the left ovary hangs from the outer wall, is a thick disc, about the diameter of a halfpenny, immediately under the lining membrane. The outer wall is peritoneum, hardly thickened. The middle wall is about one sixth of an inch in thickness.

The cyst wall, on microscopic examination, was found to consist of an outer fibrous coat, a middle layer of well-developed plain muscular fibres separated in some places by loose connective tissue, and an inner coat of connective tissue not lined by any structures resembling epithelium or granulation tissue.

It is impossible to say whether the tumour consists of a cyst which has grown from some part, possibly the left broad ligament extending to the right between the uterus and rectum, thus becoming adherent to the surrounding parts, or whether, on the other hand, it is the product of an inflammatory process with pseudo-cystic walls.

The specimen had been preserved in spirit for over a year before this examination, which will account for any discrepancies in the measurements.

C. J. Cullingworth.
Alban Doran.
P. Horrocks.

CYST CONNECTED WITH AND SIMULATING ENLARGEMENT OF THE UTERUS (pp. 165, 198).

By C. J. Cullingworth, M.D., F.R.C.P.

(Received October 22nd, 1887.)

The patient, a pale, dark-complexioned, married woman, aged 23, was admitted into St. Mary's Hospital, Manchester, November 23rd, 1886, on account of an abdominal swelling which had been first noticed five months previously. She believed herself to be pregnant, but her medical attendant having expressed some doubt on the subject, she had come to the hospital to have the matter decided. Two years before, she had been under my care under somewhat similar circumstances. She then had an abdominal swelling, and the existence of pregnancy was rendered doubtful by the regular appearance of the catamenia. On that occasion all uncertainty was removed by the detection of the fœtal heart. The catamenia continued to appear regularly up to the seventh month of gestation, and delivery took place naturally at term. This was a year and eight months ago. The catamenia reappeared profusely six months after her confinement, and continued regularly up to the present time. Remembering her previous experience, she naturally attached little importance to this fact as bearing on the question whether her present condition was due to pregnancy.

The swelling was somewhat globular, and extended from the pubes to a line about midway between the umbilicus and ensiform cartilage. Fluctuation could be felt distinctly. A soft bruit, synchronous with the radial

pulse, could be heard, being especially distinct in the left iliac region. Day after day I listened patiently for the fœtal heart-sounds, but without success.

On vaginal examination, the uterus was found to be high up above the pelvic brim. Bimanually, the tumour gave the impression of a uterus at about the seventh month of pregnancy. The least external manipulation of the tumour was felt so distinctly by the finger placed on the cervix that little doubt was felt about its being uterine.

After being ten days in the hospital she expressed a desire to go home, and was discharged feeling quite well. As I was unable to express a decided opinion as to her condition, I desired her to return after a little time.

She came back sooner than was expected. On December 18th, after being at home a fortnight, she began to have a slight hæmorrhage, as if beginning to menstruate. At 4 a.m. the following morning the discharge became suddenly more profuse, and continued to be so until 8.30 a.m. on the 20th, when she was suddenly seized, while sitting up in bed, with severe abdominal pain. At the same time she noticed that the abdomen, which had been very tense, became suddenly soft. For some minutes she was unable to lie down. At 1 p.m. the same day she was brought to the hospital pale and collapsed. Her pulse was 130 and thready. The pain was still intense, necessitating the free administration of opiates. At 7 p.m. the temperature was 101·8°; pulse 150. The following day the pulse was stronger and less rapid; maximum temperature 102°.

On December 26th she was much more comfortable; the temperature had been normal for two days and the abdominal swelling had diminished. A distinct, firm, elongated, moveable tumour, inseparable from the uterus, could be felt in the lower part of the abdomen.

On January 8th, 1887, the abdomen was noted to be again becoming distended, evidently this time from ascites. The tumour could no longer be distinguished. The

patient's appetite had failed, and she was rapidly losing ground.

On the 19th I opened the abdomen. There was a large quantity of ascitic fluid (six pints) with much flaky lymph floating in it. The peritoneum, both visceral and parietal, was covered in many places with patches of lymph. The uterus, or what appeared to be the uterus, was enlarged to the size usual at the fifth month of pregnancy; it was soft to the touch and bound to both broad ligaments and to the posterior wall of the pelvis by bands of adhesion which formed a kind of coarse network, and completely obliterated Douglas's pouch. The right ovary was enlarged to the size of a hen's egg, and both it and the right tube were covered with a thick layer of lymph, which was easily peeled off, leaving a smooth surface beneath. The ovary was ligatured and removed (with its adjacent tube) and was found on section to contain a number of small cysts with opaque gelatinous contents. The left ovary was normal. The omentum was enormously thickened. On its lower and posterior aspect was a whitish patch beneath the peritoneum. A similar patch appeared on the upper surface of what was thought to be the enlarged uterus. As much of the ascitic fluid and lymph was removed as possible. Nothing like a ruptured cyst was discovered, or anything which explained the sudden collapse on the 20th of December.

No purpose would be answered by giving details of the subsequent history. Suffice it to say that the patient went on moderately well until the end of the first week, when symptoms of catarrhal pneumonia supervened, whereupon she gradually sank. Death took place on January 30th, eleven days after the operation.

At the autopsy (conducted by Dr. Thomas Harris, pathologist to the Manchester Royal Infirmary) about half a pint of ill-smelling pus was found in the peritoneal cavity, the peritoneum being covered with numerous patches of flaky lymph. In each lung there were several patches of catarrhal pneumonia. The greater part of the

pelvis was occupied with what appeared to be the uterus enlarged. On closer examination, however, after removal, the uterus was found to be of normal size, and what had appeared to be the enlarged uterus proved to be a large thick-walled cyst, with the uterus so embedded in its anterior wall as to be easily overlooked while the parts were *in situ*. The cyst was from seven to eight inches long, five inches broad, and one and a half inches in its antero-posterior measurement. It was most prominent on the left side, but extended behind the uterus to the right. On section a quantity of thick, opalescent, jelly-like fluid escaped, in which were some portions of tissue like softened parchment. No fœtal remains were found. The inner surface of the cyst wall was white and smooth posteriorly, while anteriorly it was deeply corrugated. Adherent to it at its upper part was a rounded circular patch of brownish-coloured leathery tissue about the size of half-a-crown, and one eighth of an inch in thickness. The left Fallopian tube ran along for some distance in the wall of the cyst, but did not anywhere communicate with it.

A portion of the raised patch from the interior of the cyst was removed for microscopical examination, but although the appearances were not inconsistent with its being the much degenerated remains of a placenta, there was no structure which, in Dr. Harris's opinion, justified him in positively identifying it as such.

Mr. Bland Sutton was of opinion that Dr. Cullingworth's specimen was really a hydatid cyst, and asked if this view of its nature had occurred to the Committee when examining it. The description corresponded exactly to such a cyst growing in that situation.

Dr. Horrocks said that the idea of a hydatid cyst had not entered his mind, and he thought that the thickness of the middle muscular coat of this specimen negatived that supposition.

Mr. Bland Sutton, in answer to Dr. Horrocks, would say that the presence of a layer of muscle-fibre further supports such a view of its nature.

Dr. Cullingworth was sorry that, owing to an unfortunate

mistake, the fluid taken from the cyst was thrown away before it had been examined, so that he was unable to give any information as to whether or not it contained hooklets. The cyst was unlike anything he himself had previously seen, but he thought the suggestion offered a few days ago by Mr. Shattock, and now repeated quite independently by Mr. Bland Sutton, was in all probability correct, namely, that the specimen was a degenerated hydatid cyst of the posterior wall of the uterus, and left broad ligament.

Mr. Doran could find nothing but negative evidence in favour of the opinion that the cyst represented hydatid disease. He did not deny that, as Mr. Sutton had observed, it lay in just the place where that morbid condition was usually found when it attacked the female pelvic organs, and he called to mind an instructive plate in Freund's 'Gynäkologische Klinik,' representing hydatids between the serous and muscular coats at the back of the uterus. In that case the cysts were widely disseminated as usual. No trace of any hydatid tumour could be found elsewhere, either at the necropsy or during the examination of the parts by the Committee.

Dr. Graily Hewitt inquired as to the state of the liver. Some years ago he had recorded a case where a hydatid tumour was diagnosticated during life behind the uterus, and in which hydatids escaped through the uterus into the vagina, the situation of the tumour being the same as in Dr. Cullingworth's case.

THE GLANDS OF THE FALLOPIAN TUBES AND THEIR FUNCTION.

By J. Bland Sutton, F.R.C.S.,

HUNTERIAN PROFESSOR, ROYAL COLLEGE OF SURGEONS; ASSISTANT SURGEON, MIDDLESEX HOSPITAL.

(Communicated by the President.)

(Received November 4th, 1887.)

(*Abstract.*)

The object of this paper is to endeavour to show that the mucous membrane of the Fallopian tubes in the human subject is, contrary to the current opinion, glandular, and that the tubes themselves have a function beyond acting as simple passages for the ova. The structure of the Fallopian tubes has been so carefully investigated by competent histologists, that the question is merely one of interpretation. The homology of the various parts of the human uterus and the avian oviduct is described, and the function of the parts considered. Thus the infundibulum and albumen segment of the oviduct, correspond with the Fallopian tube and its fimbriæ. The shell-forming segment and the uterus proper are homologous, whilst the vagina is the homologue of the isthmus and the oviducal portion of the cloaca. The nature of a gland is considered, and comparison made between the epithelial diverticula of the oviduct, the uterus, and Fallopian tubes, in order to show that the so-called rugæ of these tubes are really glandular diverticula, whose function is to secrete an albuminous material comparable to the albumen of an egg. From this substance the embryo obtains pabulum by means of the chorionic villi.

The Fallopian tubes in the human female are described by all the writers who have devoted any attention to the matter as devoid of glands. The object of this paper is to attempt to show that the mucous membrane of these tubes is glandular, and the tubes themselves have a function beyond acting as simple passages for ova.

The structures of the Fallopian tubes has been so carefully and systematically examined by competent histologists, that the mere facts of the case are beyond dispute,—the question is one of interpretation.

At the outset of the matter it was very clear, that the question could not be settled by merely examining the tubes in the human female, hence a goodly supply of comparative material was accumulated and investigated as time and opportunity permitted. The result of the inquiry is interesting, for I have been obliged to interpret the nature of the mucous membrane in a sense at a variance with the best anatomists and physiologists.

The Müllerian ducts, as oviducts, attain their highest development in birds. In the chick both ducts are present, but the right one atrophies, the left one alone attaining a functional condition. In winter, the oviduct is a straight and narrow tube lying in the hollow of the pelvis; in the breeding season it is a wide, thick, and convoluted tube larger than the intestines.

For morphological purposes we may divide the oviduct into four portions as shown in Fig. 1. Each point is very distinct in so far as function is concerned. The first segment is the infundibulum, and receives the ovum as it is dehisced from the ovary. The second, or albumen portion, covers the ovum with albumen secreted by its glands. In the third, or uterine segment, the shell is formed, whilst the fourth part, or isthmus, connects the oviduct with the cloaca.

It is established beyond all possible doubt that the mammalian uterus is formed from the median coalescence of the lower segments of Müller's ducts. The embryo-

logical history of the uterus, and its associated ducts, furnish a ready key to the homology of the various parts of the uterus and avian oviduct. Thus in the diagrams

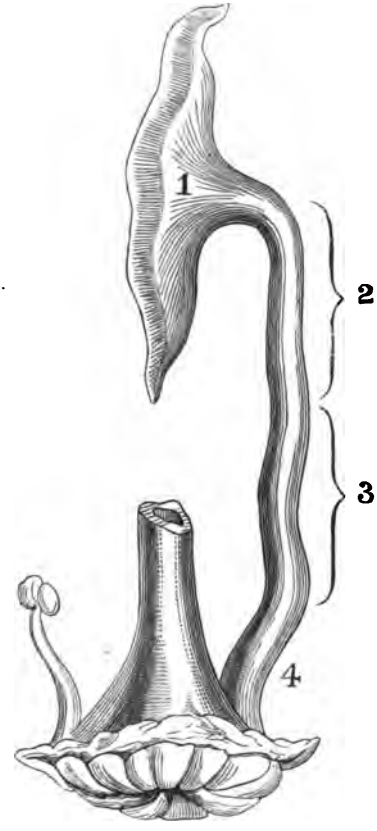


FIG. 1.—The oviduct and cloaca of a bird. 1. The infundibulum. 2. Albumen segment. 3. Uterine portion. 4. The isthmus.

Figs. 1 and 2 it will be clearly seen that the infundibulum and the fimbriated end of the Fallopian tube are homologous. The tube and albumen segment of the oviduct correspond. The uterus, with the cervix and upper segment of the vagina, represent the shell-forming part of

the oviduct. The isthmus and the remainder of the vagina are homologous. The region of the cloaca, related to the oviducts, is developed from that portion of the proctodæum which in the human subject furnishes that piece of the genital passage external to the hymen.

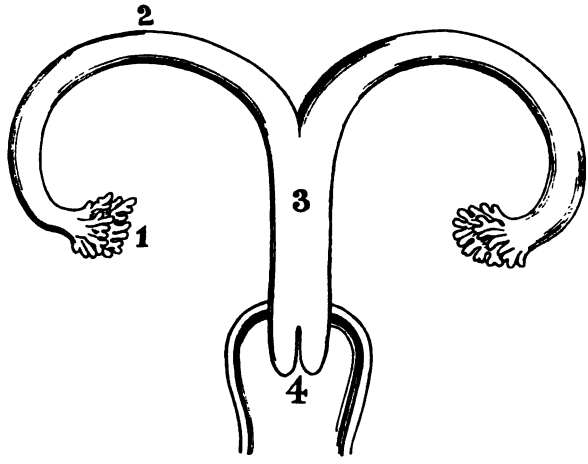


FIG. 2.—An outline sketch of a human uterus. The numbers indicate the parts which are homologous with those of the bird's oviduct.

The morphology of the parts being disposed of we must now discuss the question of glands. Restricting our observations to vertebrata, we may define a simple gland as a sack or tube derived from an invagination of the surface epithelium. Larger and more complicated glands may be derived from this as the result of continued or irregular outgrowth, Fig. 3, A.

When we compare a transverse section of the body of the uterus with a similar section from the Fallopian tube, we expect to find branched recesses lined with epithelium in order to pronounce them glands. If we examine the mucous membrane of the uterus we shall find the glands but slightly advanced upon the simple tubular pattern.

My attention was first drawn to this matter whilst engaged in studying the histology of the bird's oviduct.

My impression was, that, considering the elaborate work required of the mucous lining of this remarkable tube, viz. not only the production of an albuminous investment for the ovum, but the subsequent deposition of a calcareous coat, built on a definite plan, glands exhibiting a high degree

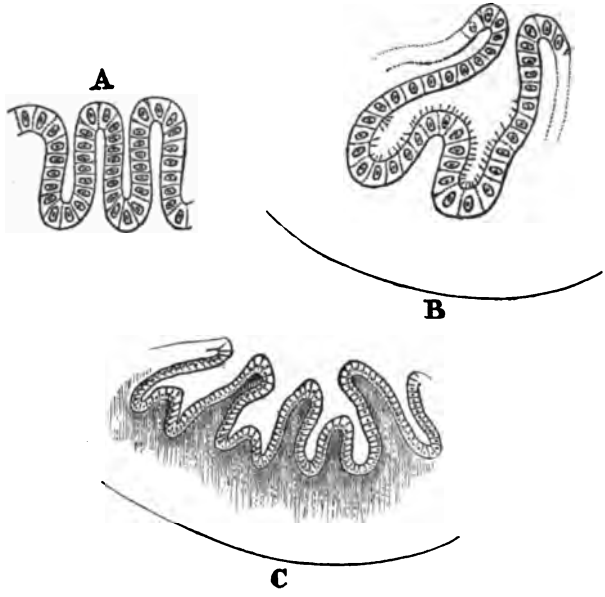


FIG. 3.—A. Epithelial diverticula representing the simplest form of glands found in mammals. B. Acini budding from a simple diverticulum to form a complex gland. The arrangement of parts in this drawing is from the so-called rugæ of the Fallopian tube. C. A transverse section of a bird's oviduct. The disposition of the epithelium corresponds to that in the human Fallopian tube.

of complication would be discovered. To my surprise I found that the glands were of the simplest character and consisted of infoldings of the surface epithelium as shown in Fig. 3, B. In transverse section, the furrows follow the long axis of the oviduct exactly as the so-called rugæ follow the long axis of the Fallopian tube.

It is also important to remember that the so-called

rugæ of the Fallopian tubes arise in the same way as the uterine glands, that is, they originate as simple diverticula, and this may be demonstrated not in the early embryo, but in the fœtus at birth. At this date the uterus may be described as almost glandless in comparison with its adult condition. Further, in the baboon the uterine mucous membrane resembles, when viewed in transverse section, the plicated arrangement of that lining the Fallopian tubes in the human subject.

There is yet another circumstance which may be put in evidence in support of my contention. In catarrhal conditions of the mucous membranes the orifices of the glands are not infrequently obstructed leading to the distension of the acini. In the Fallopian tube when distended by its secretion an analogous condition may be observed, and under such conditions the rugæ, instead of disappearing, become thinned and lengthened exactly as the walls of a cyst become thinned and expanded.

Admitting the glandular nature of the rugæ of the Fallopian tube we must now concern ourselves with the function of the parts. This is not a matter of difficulty. In oviparous vertebrata it is the duty of this segment to secrete a viscid albumen for the investment of the ovum. This serves as a store of nutritive material for the embryo.

So far as the human ovum is concerned there is little room to doubt that the viscid albuminous material secreted by the glands of the Fallopian tube serves as pabulum for the embryo in its early stages, absorption taking place by means of the chorionic villi, which, standing upon the zona pellucida, are immersed in a highly nutritive bath furnished by these glands.

Mr. DORAN considered that to Professor Sutton belonged the credit of specially demonstrating the glandular character of the tubular mucous membrane. Herring, about fourteen years since, had first asserted that there were glands in the Fallopian tube of woman but had not convinced other authorities. Many scientists and pathologists had observed glandular crypts and tubules since Herring had published his work on the Fallopian

tube, but they had not taken the pains to submit their researches to the consideration of others, through literary or other means. Mr. Doran regretted that Professor Sutton had not shown the working of his problem by supplying accurate drawings with his monograph. The diagrams which he had prepared showed very well what he meant, but sceptical scientists would further demand a true and lively portraiture of what he had seen. The "goodly supply of comparative material" must not be taken for granted.

Dr. GRIFFITH felt sure that this question, like so many others, would be decided by the study of comparative anatomy and physiology, and felt some regret that Mr. Sutton had given no information about the special glands found in the oviducts of certain orders of vertebrates, the Selachii and Chimæra, frogs, some tortoises and birds, which must be taken into consideration in discussing the function of the highly specialised mucous membrane of the human oviduct.

Mr. BLAND SUTTON, in reply, stated that he had found the oviducts of sharks, amphibians and reptiles, extremely useful in many ways, but when it came to be a question of structural peculiarity in a mammal they afforded little that was trustworthy. Doubtless the opinion that the rugæ of the Fallopian tube were glandalar in function had occurred to many, but they lacked the boldness or, perhaps, the rashness to express it.

ERRATUM.

Page 212, lines 1 and 5 from bottom, *for* Herring *read* Hennig.

HEMIPLEGIA OCCURRING NINE DAYS AFTER PARTURITION; DEATH; PARTIAL POST-MORTEM EXAMINATION.

By Ed. Fowler Scougal, M.A., M.B., Huddersfield.

(Received November 17th, 1887.)

(Communicated by Dr. Braithwaite.)

Mrs. R. H. I., aged 37, was, on the 21st of August, 1887, confined of her seventh child. But for a slight tediousness in the passage of the fœtal head along the perinæum the labour was easy and natural, and, except for slight after-pains for the first forty-eight hours, there was absolutely nothing to complain of, and the patient was as well as could be wished. Her general condition was excellent, and she suckled her child. All went well till 9.30 p.m. on the 28th of August, *i. e.* seven days after the confinement. Then she complained of numbness and tingling in the first, second, and third fingers of the left hand. This was looked on as some trifling thing. About 1.30 a.m. August 29th, the patient was observed passing her right hand up and down her left shoulder and side, as if feeling for something, and yet in an aimless manner. Nurse asked if anything was wrong, but the patient said no. The nurse, however, was not quite satisfied, and, on looking more closely at the patient, noticed that the mouth was slightly drawn to the right side, and rightly thinking things serious, sent for the doctor. The following was the condition noted at the time of visit—3.30 a.m. There was complete paralysis of the left arm, and paresis of the left leg. There was slight divergent strabismus of the

right eye, and the mouth was slightly drawn to the right side. There had been a slight difficulty in swallowing, now passed away. The patient was quite conscious, and speech was unaffected. She complained of some pain on the right side of the head. The skin was moist; pulse 96, temperature normal. There was no loss of sensation. She was ordered the following medicines:—Pil. Calomel gr. iiiss to be taken immediately, and followed every two hours afterwards by ʒij of Æsculap water till catharsis was produced; and this mixture: Pot. Iodid. gr. xv, Pot. Citrat. ʒij, Spir. Ammom. Arom. ʒj, aquam ad ʒvj, one sixth part to be taken every four hours. At 7 a.m. the condition was much the same, though the strabismus was gone, and the patient said she felt better; pulse 102. At 1 p.m. there was complete paralysis of the left leg. The bowels having moved only once, the patient was ordered to have an enema of warm water. At 5 p.m. the condition was much the same, and at 9 p.m. the patient was sleeping gently, breathing easily and quietly, the pulse being 80, quiet and compressible. Temperature normal. She had taken fluid food through the day, and swallowed without difficulty.

August 30th.—At 8.30 a.m. the report was:—The patient has had a quiet night. Bowels have been twice moved by enemata given at the patient's own request. Speech is now affected, but only in articulation. There is no unconsciousness, pulse 60, temperature normal. At 3 p.m. there was no material alteration. At 9 p.m. the condition was still much the same. There had been through the day a slight difficulty in swallowing food. Since 8 p.m. there had been a great tendency to sleep, and the patient was still, at 9 p.m., very drowsy.

August 31st.—At 8 a.m. the report was that the patient had had a restless night, and had not taken food well, swallowing being more difficult than before. She is now more drowsy and apathetic, but can easily be roused. Nutrient enemata were ordered, and sinapisms applied freely over the body. At 12.30 p.m. the condition was

worse. The patient was very restless, and complained of much pain on the right side of the head. The mouth was slightly drawn to the right side. Pulse 50, irregular, thin, hard, and laboured; temperature 99·2° F. At 8 p.m. there was still great restlessness, and more difficulty in swallowing. Pulse was irregular in rhythm and power, varying from 72 to 84 beats per minute. The milk had quite disappeared from the breasts.

September 1st.—At 8 a.m. the patient was much worse. The paralysis had extended to the whole left side of the body, swallowing seemed impossible, fluids simply running out of the mouth again. The patient was comatose, though with difficulty she could be roused. There was again right divergent strabismus, and the pupils were both a little dilated, but equal, and inactive to light; pulse about 90 and very irregular. At 12.30 p.m. the patient was quite unconscious and insensible. The bowels were constantly moving, and no enemata could be retained. The breathing was heavy and stertorous. This condition remained practically unaltered till death, which occurred at 2.15 p.m., *i. e.* not quite four days after the feeling of numbness in the fingers occurred.

Permission was obtained for a post-mortem examination, but only of the brain. This was made on September 2nd, and there were found two clots, one in a vein on the surface of the brain corresponding in position to the right middle meningeal artery, the other in a vein corresponding in position to the right middle cerebral artery. There was no sign of thrombi in the sinuses, and no sign of any extravasation of blood in any part of the cerebrum, cerebellum, pons Varolii, or medulla. The clots were distinctly ante-mortem, and for part of their extent adherent to the vessel, and appeared considerably to distend their walls. The substance of the brain was free from any morbid appearance.

Dr. Leith Napier said that, with reference to Dr. Scougal's paper, puerperal hemiplegia was practically due to one of three

conditions: thrombosis, embolism, or reflex influences, the first being found in the great majority of cases, the two latter rarely, He believed arterial thrombosis was, on the whole, commoner than venous, and that many cases might be due to syphilis, rheumatism, or Bright's disease. Points of interest in the paper read were the comparatively limited venous area affected, and the non-implication of an artery or of the sinuses. In two cases which he had had an opportunity of seeing post mortem there were thrombi of the lateral sinuses. It was surprising that thrombosis did not occur more frequently, the well-recognised state of the blood and the cardiac hypertrophy of pregnancy rendering it pathologically probable. Embolism was very rare; he had recorded a case of right-sided hemiplegia with aphasia due to embolism eleven years ago; since then very few, certainly not half-a-dozen cases, had been published.

A CASE OF EXTIRPATION OF THE UTERUS FOR PRIMARY CARCINOMA OF THE BODY.

By ARTHUR H. N. LEWERS, M.D.Lond., M.R.C.P.Lond.,
ASSISTANT OBSTETRIC PHYSICIAN TO THE LONDON HOSPITAL.

(Received January 17th, 1888.)

THE uterus removed was shown at the meeting of the Society in March, 1886 ('Obst. Trans.,' vol. xxviii for 1886, p. 67). I am now able to give a complete account of the case.

A. R—, aged 58 (she at first gave her age as 56, but afterwards said she was 58), a washerwoman, was married in 1859. Her husband left her three and a half months after marriage. She had one child, which was stillborn. No miscarriages.

She was admitted into the London Hospital on the 26th of February, 1886, complaining of having been constantly "unwell" for the previous ten months, and of having had very severe pain "at the bottom of the stomach," reaching down the thighs to the knees, for two months. She had also had a watery, slightly blood-stained discharge, at times a little offensive.

Family history.—There was no history of cancer or phthisis in the family.

Previous history.—There was nothing of medical interest in her previous history. Before her marriage she had been a nurse at the London Hospital and also at Westminster Hospital, and she had gone out as a nurse during the Crimean war.

History of the present illness.—Symptoms first appeared ten months ago as mentioned above. Shortly before the commencement of her illness she had lost some money in her business, and had fretted a good deal about it.

In May, 1885, she became "unwell" very suddenly; the discharge was of a deep red colour, and came away in clots. She had no pain at that time; the discharge continued for six weeks or two months; it then left her for a day or two, but came on again as badly as ever. She has lost flesh, and latterly she has lost her appetite.

The pain and the watery, reddish-yellow discharge came on about two months before admission, the pain a little before the discharge. For the last month the discharge has been offensive.

The pain soon became very severe indeed; she felt it most in the hypogastric region, and down the inside of the thighs as far as the knees. First of all it was of a throbbing character, but latterly like something cutting her severely. The pain was always much worse at night, and kept her awake. She was often "doubled up" with the pain. It was never relieved by lying down, but, if anything, was made rather worse.

Menstrual history.—The only feature of interest was that the menopause occurred comparatively early—when she was only thirty-eight. Since then she had "seen nothing" till ten months ago.

Present state (February 26th, 1886).—Abdomen a little prominent below the level of the umbilicus; a little tender in the same region.

Vulva.—Some erythematous vulvitis present, such as is produced by irritating discharges. On asking her to strain, a watery yellow discharge escaped from the vagina.

Vaginal examination.—Vagina short. One very sharp "bridle" runs outwards from the left side of the cervix to the adjacent vaginal wall. Vaginal portion of the cervix normal. A hard lump the size of a cobnut is felt posteriorly, apparently in the supra-vaginal cervix. The examination caused her a good deal of pain; chloroform was therefore given, and a thorough examination made.

The uterus was found to be freely moveable. The body could be felt bimanually, lying to the right of the middle line in a position of anteversion. The body was enlarged

to a considerable extent, taking into account what the normal size of the uterus should be at the patient's age.

Through the speculum, before passing the sound, some blood-stained discharge was seen escaping from the external os. Small fragments of a soft, brain-like material appeared in the discharge after passing the sound.

March 1st, 1886.—The uterus was extirpated *per vaginam* as follows:

The patient being in the lithotomy position the uterus was drawn down by means of a strong hook. The perinæum was incised as a preliminary measure to give more room. The limits of the bladder towards the anterior lip of the cervix having been ascertained, a transverse incision was made with blunt-pointed scissors into the anterior vaginal wall, and the bladder separated from the uterus; but the utero-vesical reflection of the peritoneum was opened at this stage.

The cervix was now carried well forwards, and a transverse incision made into the posterior vaginal wall close to the cervix. Douglas's pouch was then opened to a small extent with the scissors, and the aperture in it enlarged by tearing with the fingers. Owing to the size of the uterus it was impossible to pass the fingers over the fundus to the utero-vesical pouch of peritoneum, so as to open this on the finger. It was easy, however, to tear through it from below. The ends of the transverse anterior and posterior incisions were connected by lateral incisions, at first only as deep as the mucous membrane, and the lateral attachments of the cervix were tied on each side by silk ligatures passed with an aneurysm needle from behind forwards. The cervix was then cleared as high as the level of the internal os. Each broad ligament was then transfixed and tied in two halves, stout silk ligatures being employed. The broad ligaments were then cut through, and the uterus separated. It could not be retroverted and brought out fundus first; it was therefore brought out cervix first, fundus last.

Considerable difficulty was met with in getting the

uterus out on account of its size, after it had been completely separated. The wound in the peritoneum was closed with silver sutures, the ends of the broad ligaments being adapted between the edges of the wound, and a small drainage-tube was left projecting half an inch into Douglas's pouch. The vagina was filled with eucalyptus gauze freely sprinkled with iodoform. The drainage-tube was found loose in the vagina two days after. The operation lasted one hour and forty-eight minutes. On removal the uterus was found to weigh seven ounces. On opening it, an extensive papillary growth was seen projecting into the cavity of the body. The growth occupied the right side of the cavity; its attachment was separated from the healthy mucous membrane by a sharp line of demarcation.

A few nodules the size of peas showed through the peritoneum near the fundus, forming somewhat white elevations.

The highest temperature after the operation was on the evening of the second day, when it reached 102·2°. From and including the fifth day the temperature was normal, and the patient made an uninterrupted recovery.

Previous to the operation, the temperature reached about 100° at night, falling to normal in the morning.

Subsequent history.—The patient was seen after leaving the hospital from time to time, but with great difficulty, as she would not come up to show herself at the hospital, and had to be followed from one address to another in the East of London. She enjoyed good health, and was free from pain.

In October, 1886, an examination was made and no return of the disease was found. She was not seen again till the end of January, 1887, when, though about her work as usual, she was getting thin again, and for about a month had had bad pains across the lower part of the back and down the left leg, and also a profuse watery discharge, at times red, but she had not lost much blood. She had also been suffering from boils. She would not

be examined on that occasion, and it was not till a week or two later that an examination could be obtained. Then, on vaginal examination, a lump the size of an orange was felt filling the upper part of the vagina; it was fixed, and the surface towards the vagina was ulcerated, and bled readily.

The patient was readmitted to the Hospital, and gradually went from bad to worse, dying on July 7th, 1887, sixteen months and seven days after the operation. For some weeks before her death a hard mass could be felt in the umbilical region.

Post mortem there was found some recent adhesive peritonitis in the pelvis. A hard mass occupied the greater part of the pelvic cavity, particularly on the left side. The mass in the umbilical region lay on the lumbar vertebræ, and was about the size of an orange; it appeared to be due to secondary deposit in the lumbar glands. No secondary deposits in the liver, lungs, or other organs. There was hydronephrosis of the left kidney; the right kidney was fairly healthy, but its capsule could not be separated without tearing the substance of the kidney. There had been no symptoms of uræmia.

Remarks.—This patient had about ten months of renewed health and comfort, such as enabled her to resume her ordinary work, as a result of the operation. The pain had been exceedingly severe before the operation, and the complete relief afforded from it was a very gratifying feature in the case. It will be seen that symptoms had existed for ten months before she came to the hospital, so that the case was by no means an early one. I certainly think her life was prolonged by the operation, for during the period of non-recurrence she was free from the constant loss of blood, from the pain that kept her from sleeping, and her appetite returned; and I think, therefore, it is fair to conclude that, if she had not had the operation done, she would have died much sooner.

Sections of the growth in the uterus showed it to be carcinomatous.

Dr. HORROCKS asked whether the diagnosis of cancer of the fundus uteri had been established before the operation, and if so, in what manner? Had the discharge from the uterus been examined microscopically, and had it thrown any light on the disease? He said he had seen the uterus totally extirpated in three cases for cancer of the fundus uteri. Two of these cases died from acute peritonitis two or three days after the operation, whilst in the third case the disease proved to be endometritis, and not cancer. The patient recovered. These cases had been operated upon by others, he himself never having felt justified in recommending such a serious operation when the chances of cure were so remote.

The PRESIDENT said that he was glad that Dr. Lewers had not published his case until he was able to give a complete account of it. It had been proved that total extirpation of the uterus for cancer of the cervix was not justified, because supra-vaginal amputation was less dangerous and furnished as good results; and the recurrence, when it took place, appeared in the cellular tissue around the cervix, and not in the uterine stump. We were not yet in a position to form a judgment as to the value of total extirpation for cancer of the body. The data at our disposal were too few. The mortality was still very high, and recurrence frequent and early, so early in the majority of cases that it was doubtful if in the majority of cases life is at all prolonged. At the same time it cannot be doubted that, in all cases which recur, a longer or shorter respite from severe suffering is given by the operation.

Dr. LEWERS entirely agreed with the President that, as a general rule, extirpation of the uterus for cancer of the cervix was an unjustifiable operation. In the great majority of cases cancer of the cervix tended to spread to the vaginal wall, and to the circum-cervical connective tissue, rather than up to the body of the uterus. In the few cases where the disease tended to spread first in the latter direction extirpation of the whole uterus was justifiable. It was the fact that latterly much improved results, so far as the mortality from the operation was concerned, had been reported, but these results had been obtained in extirpation of the uterus for cancer of the cervix. In that condition the body of the uterus was not enlarged, and one of the chief steps of the operation, viz. securing the broad ligaments, was then relatively easy. In cases where the uterus was extirpated for primary malignant disease of the body the body of the uterus was enlarged very considerably, and tying the broad ligament was a matter of much difficulty. In such cases Dr. Lewers believed that the mortality at the present time was very much what Dr. W. Duncan had calculated it at in his paper read before the Society, viz. 28 per cent.

JUNE 6TH, 1888.

JOHN WILLIAMS, M.D., President, in the Chair.

Present—46 Fellows and 6 Visitors.

Books were presented by Dr. Calderini, Mr. J. Lee Jardine, Dr. Lewers, and Dr. John Williams.

Some portraits of English obstetricians were presented by Dr. J. Braxton Hicks.

Robert Dane, M.R.C.S., and George A. Pratt, L.R.C.P.Lond., were admitted Fellows of the Society.

Henry Corby, M.D. (Cork); Isaac Rising Cory, L.R.C.P.Lond. (Shere, Guildford); Robert Brooks Popham, L.R.C.P. and S.Ed. (travelling); and Patrick Cumin Scott, B.A., M.B.Cantab. (Blackheath), were declared admitted.

The following gentlemen were elected Fellows:—William Steer Riding, M.D.Edin., and Joseph Theophilus Weston, L.K.Q.C.P., and L.M. (Tirhut).

The following gentlemen were proposed for election:—Charles Milton Fegen, M.R.C.S. (Bedford); John George Johnson, L.R.C.P.Lond. (Swindon); and William Japp Sinclair, M.D.Aber. (Manchester).

INVERSION OF UTERUS BY A GANGRENOUS FIBROID.

By G. Ernest Herman, M.B.

The patient was aged 38, and had had two children, the last six years ago. She had suffered from excessive menstrual losses for about eight months. On May 21st she noticed a lump in the vagina. That evening she had a great hæmorrhage. She was admitted under Dr. Herman's care on May 30th. There was then a gangrenous mass nearly as large as the fist hanging out of the vulva. This was attached to a fleshy column covered by mucous membrane, which occupied the vagina, and at the base of which no os uteri could be felt. By bimanual rectal examination this was ascertained to be the inverted uterus. The gangrenous mass was peeled off mostly with the fingers, but at one or two points scissors had to be used to complete the separation. After the separation there was free venous (not arterial) hæmorrhage, which was arrested by ligatures. The bleeding tissue was very soft. Aveling's repositor was then applied. It was left on eighteen hours, but its continued use was followed by such copious and extremely offensive discharge that it was evident that gangrene was progressing, and therefore the repositor was left off. Patient died on June 1st. The specimen showed that the fundus uteri was thinned, being partly eaten away by the progressing gangrene.

SECRETION OF MILK IN A NEW-BORN MALE CHILD (LIVING SPECIMEN).

By William Duncan, M.D.

VESICAL CALCULI FROM A CASE OF PROCIDENTIA.

By Aust Lawrence, M.D. (Clifton).

The calculi, consisting of thirty medium-sized, and a large number of fine granules, and weighing altogether nearly 3 oz., were removed by vaginal cystotomy from a woman who had suffered from prolapsus uteri for eighteen years. The whole pelvic viscera were completely outside the vagina. The bladder wound was kept open for some time until all traces of cystitis had disappeared, when it was allowed to heal, and the viscera were replaced. Result complete cure.

Dr. Cleveland inquired the composition of the calculi, and stated that a short time ago he was called to a lady suffering great pain in the region of the vulva. On examination he found a stone about the size of a large pea blocking the orifice of the urethra. With the aid of a director this was easily removed. The patient was the subject of general paralysis of some months' standing, and had had retention, followed by incontinence, of urine. Subsequent examination of the water, as well as occasional sounding of the bladder, gave no evidence of further calculous formation. Since the occurrence the general health, under the use of various tonics, had improved, but no power had been regained by the bladder, and the urine, when specially collected for examination, though pale and clear, had been persistently alkaline for three months. Benzoic acid had been fairly tried without effect. The calculus removed was composed of phosphates.

WATCH-SPRING HODGE PESSARIES.

By Braxton Hicks, M.D., F.R.S.

Report of Committee on Dr. Horrocks's specimen of Inverted Uterus with Fibroid exhibited at the Obstetrical Society, May 2nd, 1888. (Supra, p. 196.)

THIS specimen consists of the unimpregnated uterus completely inverted, together with a fibro-myoma growing from the fundus. The tumour and uterus combined measure 4 inches in length: 1¾ inches the tumour, and 2¼ inches the uterus. The amputation has been made through the cervix uteri, near the os externum. In the concavity formed by the invaginated uterus are the Fallopian tubes, round ligaments, and the ligaments of the ovary. The peritoneum is smooth and healthy, and there is no trace of any adhesions. The uterine wall is slightly hypertrophied. The mucous membrane, which is normal in thickness throughout, is quite continuous over uterus and tumour; but the part on the uterus is smoother than that over the tumour; moreover, it is more uniformly red. The uterine orifices of the Fallopian tubes are distinctly seen, 1½ inches apart; bristles can be passed into them only for a very short distance. The uterus is pear-shaped, and on the posterior aspect a distinct groove marks the division between the fundus and the fibroid. No such groove is to be found on the anterior surface. The specimen has been cut along the anterior surface, so as to show the cavity formed by the inverted uterus and a section of the fibroid. The union between the fibroid and the top of the fundus is so intimate that an enucleation of the fibroid would have been impossible without tearing the uterus. The fibroid is very œdematous, and the cut surface stands up in the middle. The Fallopian tubes have been cut about 1½ inches from the uterus.

Microscopic section of the fibromyoma.—The growth is made up of distinct, though small and ill-developed, plain muscle-cells, mixed with a considerable amount of pure fibrous tissue.

ALBAN DORAN.
P. HORROCKS.

NOTE ON THE USE OF ELECTROLYSIS IN GYNÆCOLOGICAL PRACTICE.

By W. E. Steavenson, M.D.Cantab., M.R.C.P.,

IN CHARGE OF THE ELECTRICAL DEPARTMENT AT ST. BARTHOLOMEW'S HOSPITAL.

(Received August 2nd, 1887.)

(*Abstract.*)

The author in this paper draws attention to the numerous cauterising agents used in gynæcological practice with the object of raising a discussion on their relative merits and values. Reference is also made to the use of the actual cautery, Paquelin's cautery, and the galvano-cautery, but the paper is chiefly devoted to advocating a more extensive use of electrolysis.

It is pointed out that this property of electricity is especially useful in the treatment of affections in parts difficult of access, and perhaps finds its widest field for usefulness in the treatment of those diseases of women in which local applications are necessary. It is a more efficient and elegant way of applying caustic than any other that we possess; it can be most accurately localised at the part it is wished to affect; the amount used and the extent of tissue to be destroyed can be regulated to a nicety, and its action can be commenced and arrested at any moment at the will of the operator. A brief account is given of the action and theory of electrolysis, and of the batteries and instruments to be employed.

Its action and the method of employing it in the following affections are then given, viz.: stricture of the female urethra; stenosis of the os uteri or cervical canal; dysmenorrhœa and sterility, in the place of the tents, dilators, or cutting instruments

that are often employed; abrasions of the cervix uteri; extra-uterine fœtation; fibroid tumours of the uterus; and cancer.

The author then again invites discussion on the relative merits of other caustics and modes of treatment employed in the affections mentioned as compared with their treatment by electrolysis.

THE number of caustics and agents used for cauterisation in gynæcological practice is extremely numerous, but I have been unable to find any paper, or the report of any discussion which has taken place, on their relative values. No doubt physicians and surgeons have their own reasons for preferring one agent rather than another, but there appears to be no detailed account of the actual effect which each agent has upon animal tissue.

What are the relative values of nitric acid, chromic acid, nitrate of silver, potassa fusa, potassa fusa cum calce, and other caustics that we use? For what reasons do we decide to use the actual cautery, Paquelin's thermo-cautery, or the galvano-cautery? Mr. Robert Ellis, in a paper read before this Society in 1861, said that "cauterising agents have a different ultimate value, and that sufficient regard had not been paid to that fact determining the nature of the caustic selected by the obstetrician." He goes on to say, "Some caustic substances are found to produce a sore of greater, and some of less vitality, a result by no means explicable simply by referring to the different chemical nature of these substances. The character impressed by the cauterising agent on the living tissue differs to a greater or less extent in each case. That resulting from the actual cautery" shows a "very remarkable contractility in the process of healing and afterwards. The cicatrix of a burn, built up of cells of feeble vitality, shows a singular inaptitude for extension, and after a time contracts in a very remarkable manner. It might be conjectured that this result—observed in no other instance to the same degree—is due to the nervous shock communicated to the living structures by the burning substance, and ultimately

affecting the nutrition of the newly-formed parts." The nutritive changes are no doubt really due to the destruction of the ends of the nerves; this also accounts for the smaller amount of pain which follows operations performed by the galvano-cautery when compared with those performed by the knife.

Paquelin's cautery, galvano-cautery, and cautery irons, require the presence of an assistant, and therefore cannot be well used at all times in the consulting room; and they all produce the disagreeable smell of burnt flesh, which is an objection when the operation takes place in a private house. The Paquelin's cautery and cautery irons have to be kept hot, and when used are introduced hot into the vagina. The heat cannot be diminished and raised at pleasure as with the galvano-cautery. If a wire loop is used with a galvano-cautery battery it can be placed *in situ* around a growth or other substance it is wished to remove before the circuit is closed. The amount of heat can be regulated, and its action commenced and arrested at the will of the operator. These details are under his control in a more thorough and complete manner than with any other form of cautery known to surgery.

The use of galvano-cautery in uterine surgery is an extensive enough subject to deserve a paper entirely devoted to its discussion. In this paper I wish to restrict myself mainly to the employment of that property of electricity which was named by Faraday "electrolysis."

The use of electricity both for caustic and cauterising purposes has been very much overlooked by the profession. I am inclined to advocate that electrolysis should take the place of all other caustics in gynæcological practice for the same reasons that galvano-cautery should take the place of all other cauteries. Electrolysis finds its widest field for usefulness in internal parts—situations that are difficult of access, and where it is wished to apply caustics or other local applications. Hence its frequent employment in the treatment of stricture in various regions, and in those diseases of women in which local applications are

necessary. It is a more efficient and elegant way of applying caustics than any other that we possess. It can be most accurately localised at the part that it is wished to affect; the amount used and the extent of tissue to be destroyed can be regulated to a nicety; and its action can be arrested at any moment at the will of the operator, the slight pain ceasing immediately the current is cut off.

I do not wish particularly to reopen the question which I raised before the Royal Medical and Chirurgical Society as to whether the contraction following the use of caustic alkalies is less than that following the use of other cauterising substances. It has often been stated that caustic potash produces a less contractile scar than any other caustic, but I cannot find any authoritative grounds for the assertion; I do not deny that such is the case, but I cannot find that the fact has been proved. It may be said that the opinion rests upon clinical observation. Dr. Matthews Duncan says that there are no grounds whatever for saying that the scars produced by caustic potash are less retractile than any others. It is sufficient for my purpose that I believe most of the Fellows of this Society prefer in practice caustic potash or potassa cum calce, although it is not determined on what grounds that preference is based. Dr. Galabin says that the best potential cautery is the potassa fusa cum calce because it is less superficial than nitric or chromic acid, while its action is more easily limited than the potassa fusa or chloride of zinc. All the good effects of the caustic alkalies can be obtained by the use of an electrode connected with the negative pole of a continuous current battery without any danger to the surrounding parts, and with the extent of its action absolutely within the control of the operator.

I can remember a controversy some ten or twelve years ago on the value of nitric acid so extensively used by Dr. Lombe Atthill, of Dublin, in gynæcological practice. An objection was raised against its use on the ground that it produced a hard, dense, and contracted cicatrix. Dr.

Duncan says that the opponents to the use of nitric acid as employed by Dr. Atthill had no grounds for saying that it produced more contraction,—they could not ascertain that fact, as the acid was applied to the internal surface of the uterus for endometritis. Dr. Duncan tells me that he has used the chloride of zinc for the destruction of cancerous growth, but does not find it so satisfactory as the actual cautery—not burning so deeply; but he agrees that the actual cautery is not suitable for private practice for the reasons I have mentioned. If chloride of zinc is to be used for internal application it can very much more readily be applied by an electrode made of zinc attached to the positive pole of a galvanic battery, and its action can be accurately controlled.

It is not necessary for me, before this Society, to more than briefly allude to the physical aspects of the question. We all know that electricity possesses the power of splitting up all chemical compounds that are conductors into their constituent elements, and that these elements when in a nascent state seize readily upon other elements in their neighbourhood, with which they can easily combine. This makes the subject of electrolysis, when applied to the human body, such a difficult one. For the body is a most complex compound of chemical elements, the same elements combined in different proportions in different situations. Therefore any attempt to explain the exact decompositions and recombinations which take place would fail, and if correct for one tissue would not hold good when applied to any other, or to the same tissue in another situation. The main facts of electrolysis can only be stated. We know that at the positive pole oxygen and chlorine are liberated, that the reaction is acid, and that the tissues in the neighbourhood become oxidised, deprived of their moisture, and are more or less charred, as after cauterisation by a strong acid, such as sulphuric acid or nitric acid. We know also that metals are decomposed, and by the theory of Grotthüs have a tendency to pass over and be deposited at the negative

pole. We know that all metals and metalloids are liberated at the negative pole, and in the case of the electrolysis of animal tissue sodium and potassium are liberated in a nascent state, readily seizing upon oxygen, and thus forming, among other compounds, caustic soda and potash. The reaction to test paper about the negative pole is alkaline, and the tissues are melted down and assume a deliquescent condition as after the use of ordinary caustic potash. But many other changes take place in an animal tissue, subject for some time to the passage of an electric current. The chemical constitution of some of the cells is so altered as to render them capable of reabsorption. This is one of the reasons why fibroid tumours and the gristly thickening about strictures are found to gradually decrease for several days after the application of electrolysis. Some of the constituent parts of these adventitious growths are so changed that they can be again absorbed. During the passage of an electric current, if not afterwards, ordinary osmotic action is increased in the direction from the positive to the negative pole; this would also account for the more ready reabsorption of any matter in a condition for being so disposed of.

For the due accomplishment of electrolysis we require a battery of high electro-motive force, one capable of overcoming a great external resistance. One Daniell's cell will not accomplish the electrolysis of water. The resistance of water to the passage of electricity is so great that if a circuit between the two poles of a Daniell's cell be completed by its intervention no current will pass at all. It is only when by the combination of two or more cells we obtain a sufficient electro-motive force to overcome the resistance of the water that the needle of a galvanometer will be deflected. I tried a short time ago with some Leclanché cells which had been used, and it required four before the slightest deflection of the galvanometer needle could be detected, and that showed barely a current strength of a quarter of a milliampère, and the very smallest bubbles of hydrogen gas could be

seen escaping at the negative pole. It will, therefore, be seen that for the efficient accomplishment of electrolysis in the human subject, which offers nearly as much resistance as water, a battery composed of a fair number of cells is required, and these cells if few in number should have been recently charged.

A certain combination of elements, such as compose the cells of any particular battery, is only capable of producing a current of a certain electro-motive force. The electro-motive force produced depends upon the constitution of the cell, not on its size. Sulphuric acid will attack or decompose zinc only at a certain rate, sixty-five grains of zinc replacing every two grains of hydrogen in the sulphuric acid. However large the cells may be this scale of interchange goes on, and anywhere else in the circuit where a chemical compound has to be traversed, it is split up exactly in the same ratio; thus, if water should be the compound, directly a current strong enough to overcome the resistance of chemical affinity is used, sixteen grains of oxygen and two grains of hydrogen are liberated in the water for every sixty-five grains of zinc consumed in the battery. Therefore a sufficient number of cells has to be used to overcome the resistance. We all know that by Ohm's law current strength equals the electro-motive force divided by the resistance. In the Daniell's cell the electro-motive force (E. M. F.) = 1 volt; and one volt through the resistance of one ohm gives a current strength of one ampère, and would take a second to pass. If we take water as offering a resistance of 1000 ohms (it must be remembered that the resistance of water varies very much according to its temperature), then one volt passed through water would give the current strength of a milliampère, and would take 1000 seconds to produce the same amount of mixed gas as one ampère would produce in one second. If the resistance is very great the current strength is very small, and the chemical action going on in the battery cell takes place very slowly. When electrolysis is applied to animal tissue chemical

changes take place in it which theoretically exactly counterbalance the chemical changes which are taking place in the battery. When sixty-five grains of zinc are decomposed in the battery a corresponding number of grains according to their chemical quantivalency are decomposed among the elements which form the substance electrolysed.

By the recognition of these facts we can determine the current strength that it is advisable to use according to the result it is wished to accomplish. If we wish simply to destroy an unhealthy surface we use a weak current; if we wish to dissolve a gristly stricture we use a slightly stronger current, or a weak current for a longer time; and if we wish to produce profound tissue changes in a uterine fibroid we use a very strong current. The best battery to use for electrolysis in hospital practice is that known as Stöhrer's zinc-carbon battery,—it lasts longer, its electro-motive force is greater, and it less frequently gets out of order. In the consulting room and for carrying to patients' houses such a battery as I exhibit here to-night is a very good one. It is a modified Leclanché battery, and the electro-motive force is therefore not so great as a Stöhrer's, but it is much more portable, and the same effects can be produced by using a larger number of cells.

The exact current strength employed cannot be accurately gauged by the number of cells that are included in the circuit. To obtain this information it is necessary to use a galvanometer or a voltameter.

The galvanometer is the more handy instrument, as it has already been graduated, and it is only necessary to read off the number of milliampères that are being used. With the voltameter some calculation is necessary before a knowledge of the current strength can be arrived at. The pole to which an electrode is attached, and the metal of which it is composed, is of some consequence, and varies in medical practice according to the diseased condition for which electrolysis is employed, and the effect it is wished to produce. Unless the action of the metal itself is also

required, it is necessary when using the positive pole to have the electrode made of platinum, because platinum of all metals is the least oxidisable, and therefore does not itself enter into the new combination of elements formed around the positive pole. For stricture of the female urethra, as in the male, a bougie electrode is used of a size larger than the largest one that can be passsd. It is of no consequence of what the metallic end of the bougie is made, for it is used with the negative pole of the battery, and when withdrawn from the urethra is as bright as when introduced. A flat electrode connected with the positive pole is placed on some indifferent part of the body. The bougie electrode is passed until arrested by the stricture, against which it is held without any appreciable pressure, but sufficient to enable it to pass into the bladder when the obstruction has melted away from before it. When the bougie-electrode is in its place against the stricture the circuit is closed, and a current of the strength of about five milliampères is allowed to pass for five, ten, or fifteen minutes, or until the obstruction is overcome. No anæsthetic is necessary, as a patient's own feelings are a guide to some extent as to the strength of the current to be used. If five milliampères cause pain the strength of the current can be reduced by taking one or two cells out of the circuit. Directly the bougie electrode has passed into the bladder the current must be broken, and the electrode removed. No further interference with the urethra should take place for ten days or a fortnight, and then most probably, instead of there being recontraction, as is usually the case when strictures are treated by dilatation, it will be found that bougies two sizes larger than the electric one at first used will pass easily into the bladder. If the urethra is still of a smaller size than it naturally should be, the operation has to be repeated again, commencing with a bougie electrode one size larger than the improved calibre of the passage will then admit.

In the same way stenosis of the os uteri or cervical canal can be treated by electrolysis for the relief of dys-

menorrhœa and sterility instead of incisions or by the tents and dilators now usually employed. The treatment by electrolysis takes a much shorter time, requires less frequent visits of the patient, and the result is more permanent.

A uterine sound adapted for connection with a battery is used with the negative pole, a pad being placed on the back or thigh as in cases of stricture of the urethra. The sound must be encased in some insulating substance to within an inch or an inch and a half of the extremity, and can then be used without a speculum without injuring the walls of the vagina or the vulva. It is usually only necessary to apply the electrode to the uterine canal for about two or three minutes, and the gain in calibre remains permanent. Different sized sounds, of course, are necessary according to the size of the os when the operation is commenced. About five milliampères will usually be found a current of sufficient strength, although stronger currents can be borne without pain in this situation than in the urethra.

The atresia of the uterine canal which sometimes follows amputation of the cervix by galvano-cautery can also be easily rectified by electrolysis.

Perhaps the most common affection for which gynæcologists resort to the use of caustics, and caustics of all sorts and descriptions, are abrasions of the cervix uteri, chronic cervical catarrh, and leucorrhœa. When one caustic does not succeed another is tried. As I have said before, electrolysis is a more elegant and efficient way of applying caustic to internal parts than any other we possess. It destroys unhealthy surfaces and promotes healing in a more reliable manner, and its action can be more easily regulated. For abrasion of the cervix I have used an electrode with a rounded end similar to that used for faradising the vocal cords. This electrode is attached to the negative pole of the battery; the pad connected with the positive pole having been previously moistened in salt and water is placed on some indifferent part of

the body. A speculum having been introduced, and the abraded surface brought fully into view, the metallic knob of the negative electrode is lightly moved over the unhealthy surface with a current strength passing of about five milliampères. A white froth resembling fine soapsuds is formed wherever the electrode touches. This froth is alkaline to test paper. All the unhealthy surface will usually be sufficiently destroyed in about two or three minutes. The electrode is then withdrawn, and all chemical action and the slight tingling produced ceases at once. There is no after-pain. If the erosion appears to extend up the cervical canal then a uterine sound electrode as already described is passed into the canal for about a minute or a minute and a half. Two or three applications of the battery in this way will often make an abraded surface heal which has for months or sometimes years resisted all other modes of treatment.

The use of electrolysis in the treatment of extra-uterine fœtation has been discussed in a paper by Dr. Matthews Duncan in vol. xix of the 'St. Barth. Hosp. Reports,' and again in an excellent paper by Dr. Percy Boulton in the 'British Medical Journal' for April 30th of this year,* p. 925. I also spoke on the subject at the meeting of the British Medical Association at Brighton in 1886. A report of the discussion can be found in the 'British Medical Journal' for December 4th, 1886, p. 1094.

The treatment of uterine fibroids by electrolysis has lately excited a large amount of interest from the great success which has been achieved by M. Apostoli in Paris, and by American physicians, notably by Drs. Engelmann, of St. Louis, and Franklin Martin, of Chicago. The practice is by no means a recent one, but has been followed in divers ways, as is shown by the tabular review I have prepared and exhibited to the Society. Apostoli appears to have arranged the details of the operation into something like a uniform and rational mode of procedure. He has now operated on a sufficient number of cases

* 1887.

(several hundred) to enable him to formulate some rules of practice which should be followed under different circumstances. In the majority of cases, those accompanied by hæmorrhage, he uses an electrode connected with the positive pole of the battery; this acts as an acid caustic, and coagulates and hardens the tissues. In cases accompanied by profuse leucorrhœal discharge and dysmenorrhœa he uses an electrode attached to the negative pole. In all cases, when it is possible, he introduces the electrode through the cervical canal, but when that is impossible he thrusts an uninsulated platinum or steel needle through the tumour into the uterine cavity, taking care to avoid the bladder in front or Douglas's pouch behind. When a channel has by this means been established he uses a positive or negative electrode in the uterine cavity according to the nature of the tumour. In some few cases he uses alternately the positive or negative pole. A platinum electrode is always chosen when the positive pole is employed. But the great distinguishing feature which marks his practice and that of the American physicians who have followed him, is the almost incredible strength of current that is used, and that, too, without an anæsthetic, and in cases in which a patient walks to his clinic, and returns to her own home after the operation is concluded. These gentlemen speak of currents of 100, 300, and even 1000 milliampères. I believe that the undoubted successes achieved in foreign lands will induce some of the Fellows of this Society to try and relieve some of the poor women who suffer here from this terrible malady by a means which appears to be effective and unaccompanied by any excessive amount of danger. If the tumours are not entirely dispelled the relief obtained by electrolysis appears to render an existence, which sometimes is almost unbearable, into one accompanied by no more discomfort than is usually experienced by a woman well advanced in pregnancy.

There is one other affection in which electrolysis is useful, and in which it might supplant the caustic agents

now generally employed. I allude to cancer. When an operation for cancer of the cervix is not deemed advisable, or will not be submitted to, great benefit and relief of pain with prolongation of life can be obtained by destruction of the cancerous growth by electrolysis. For this purpose an electrode composed of a broad piece of zinc is connected with the positive pole of a constant current battery, the negative pole being placed on some indifferent part of the body. When the circuit is closed decomposition of the diseased tissue takes place with a formation of chloride of zinc around the positive electrode. This has an advantage over destruction by ordinary chloride of zinc or the actual cautery inasmuch as the action can be localised and arrested at pleasure, and the destruction of the tissues can be regulated to the exact amount that is desired.

What I have been particularly anxious to bring before the Society this evening is the subject of the relative merits of caustics, and to advocate the more extensive use of an agent possessing caustic properties at once clean in application, effective in treatment, and completely under the control of the operator as to amount used and effect produced.

FOUR CASES TREATED BY ELECTROLYSIS.

By Lovell Drage, M.B.Oxon.

ELECTROLYSIS IN SOME CHRONIC UTERINE AFFECTIONS, WITH ILLUSTRATIVE CASES.

By R. A. Gibbons, M.D., M.R.C.P.

(Received September 7th, 1887.)

(*Abstract.*)

In this paper the author relates cases which have been under his care as in-patients at the hospital, of chronic metritis, endocervicitis, lupus minimus, caruncle of the urethra, and cancer of the uterus. The latter were accompanied by profuse hæmorrhage, and are mentioned in order to call attention to the efficacy of the positive pole in arresting bleeding.

After explaining the action of the positive and negative poles upon the tissues, the author dwells upon the advantages derived from the use of the latter as a caustic in chronic inflammatory conditions of the body and neck of the uterus. He points out that the glairy discharge, so common in this class of affections, becomes electrolysed, and that thus the lining membrane is capable of being thoroughly acted on.

He draws attention to the fact that electricity can be applied with greater accuracy that any other caustic.

Details of this treatment and the apparatus required are given, and he attaches great importance to the use of a reliable galvanometer, without which he considers there can be no accuracy.

In conclusion, the author states that he has been unable to find reference, in any of the English works he has consulted, to a similar method of employing electrolysis. He refers to the works of the French physicians, Tripier, Beauvain, Fano, and especially Apostoli, who have been working at the same subject.

THE CONSTANT CURRENT IN THE THERAPEUTICS OF GYNÆCOLOGY.

By JOHN SHAW, M.D.LOND., M.R.C.P.,
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(Received May 21st, 1888.)

(*Abstract.*)

THIS paper describes the appearances presented by a myo-fibroma when subjected, about twelve hours after its removal, to the prolonged action of a constant current, and treats of the chemical and microscopical results observed in a subsequent experiment; also of certain attendant electrical phenomena.

The different action on granulations of the positive and negative poles respectively is described, and the effects of the constant current in intra-uterine applications and punctures, on the circulation, temperature, sensibility to pain, and urinary excretion, are in turn detailed.

The author, from these observations, concludes that the constant current acts on a fibroid in a three-fold manner: (i) by electrolytic action to only a small degree, the positive pole most affecting the cellular and the negative the formed elements; (ii) by the hæmostatic action of the positive pole and the derivative influence of the negative; (iii) by increased arterial tension and so diminished nutrition accompanied by some alteration of the mutual relation of the fluid and solid elements.

IN this paper I wish to record a few observations which may be of interest in demonstrating more precisely the manner in which the constant current acts as a curative agent in the treatment of uterine disease.

Through the kindness of Prof. Williams, who gave me a uterus which he had removed with several subperitoneal

and interstitial fibroids, I was enabled to make the following observations on the appearances presented by, and resulting from the passage of, an electrical current through a fibroma.

The cut surface of such a tumour in the fresh state is decidedly alkaline to test paper, and having passed two aluminium needles to a depth of 2 cm. at a distance of 3 cm. from one another, I turned on a current of 120 ma. intensity, and immediately noticed a brisk effervescence at both positive and negative poles, with an emphysematous crackling in the substance of the tumour for some distance around. The surface in the neighbourhood of the positive pole became slightly depressed and puckered, the needle was firmly grasped by the tissue and the reaction was strongly acid, whilst around the negative pole the tissue appeared swollen, the needle was slowly forced out, and the reaction was strongly alkaline. The needle of the galvanometer, which had come to rest at 120, then began to oscillate slightly, and slowly mounted to 125 and then 130 ma., showing that the electrical resistance of the tumour diminishes with the passage of the current. At this juncture I made an observation which surprised me much, viz. that if the direction of the current was reversed, instead of 130 one only got 12 ma., and this even rapidly diminished to 5 ma. A return to the original direction of the current caused a rise to the same figure as before, viz. 130, though this slowly fell to 120 ma.

This phenomenon appears to be due partly to a condition of polarisation, partly to a chemical consideration (see note B in Appendix), and is an obvious criticism on the mode of treating tumours by reversing the current, *i. e.* as far as electrolytic action goes.

I have certainly felt the neck of the womb soften under the influence of negative intra-uterine applications, and it is a frequent observation that under positive intra-uterine stimulus a fibroid hardens very much, and remains hard after the cessation of the current. This

may in part be due to the phenomena known as electrical endosmosis and exosmosis occurring at the negative and the positive poles respectively, but probably is in greater part due to a cause which will be considered later on. Whenever the secretions formed at the two poles were examined they were always alkaline at the negative and acid at the positive, so that in the case of intra-uterine applications one could always obtain abundant evidence of acid or alkaline secretion in the vagina.

A tumour exposed to the action of an electrical current loses weight. One weighing 767·8 grains and subjected to a current of 60 ma. for ten minutes, had, allowing 0·6 grains for loss by evaporation as determined by a comparison observation, decreased in weight 4·2 gr., *i. e.* rather more than half per cent.

In order to make some investigation into the changes which occurred in the chemical constituents of a fibroma under the prolonged action of a continued current, I took an interstitial fibroid weighing 1870·7 gr., and passed through it a current of 150 ma.; this intensity slowly rose without increasing the number of cells in circuit, till at the end of twenty-three minutes it indicated 185 ma., whence it fell to 150, so that at the end of the hour it stood just as at the beginning. The loss of weight, calculated as before, amounted to 37·8 gr., or just over 2 per cent.

The negative pole was bespecked with what looked like flakes of soot, and such also appeared in the tumour.* I endeavoured to ascertain if any diminution of the bulk of the tumour occurred from muscular contraction at the moment of making contact, but could discover none, the electrolytic action beginning instantly, and so causing an overflow of oil in the tube connected with the vessel in which I made the experiment.†

It has been said that aluminium is one of the three metals unacted on by the positive, *i. e.* the oxidising

* Appendix, see Note E.

† Appendix, see Note D.

pole, the others being gold and platinum, but either this is not correct or the material supplied to me has been impure, as this needle at the end of the hour was very deeply corroded.

The acid fluid at the positive pole, when mixed with the alkaline from the negative, led to a deposit of flakes of albumen which were soluble in acetic acid, especially when aided by heat, but albumen was again precipitated from the solution on the addition of nitric acid or solution of caustic potash.

I further noticed, in making a transverse section of the tumour about midway between the poles, that the passage of the current had been marked by the development through the centre of a pale, ham-like appearance to the extent of about half its surface. Sections transverse to the direction of the current showed that the acid and alkaline reactions could be traced to a considerable distance into the substance of the tumour.*

I have attempted to make the following analysis of the tumour thus electrolysed, and to compare it with two standard tumours treated in precisely the same manner. I noticed that the electrolysed tumour shredded up rather more readily than the standard ones. I treated both in precisely similar manner. After fine division with a razor, a watery infusion was made with frequent stirrings for fifteen hours; this was then strained and pressed, the watery solution acidulated with acetic acid was boiled, the albumen received on a dried and weighed filter, and the filtrate evaporated to dryness for the extractives. The gelatine was obtained by boiling, first for a couple of hours and then for about six hours more, and each carefully dried and weighed. The fat was estimated by extracting with boiling ether, which was then allowed to evaporate, care having been especially taken to keep as clear of the capsule as possible, so as to avoid any fat from the connective tissue around the tumour; and lastly, the weight of the peptone obtainable by digestion

* Appendix, see Note C.

with Fairchild's pepsin and dilute muriatic acid was noted as also the weight of undigested residue.

In order to compare the result I have reduced both to a percentage; thus, 100 grains of the tumours respectively contained

(100 grains.)	Standard tumour.	Electrolysed tumour.
Soluble albumen	. 2·01 gr.	2·21 gr.
Extractive .	. 1·18 gr.	1·76 gr.
Fat . .	. 0·49 gr.	0·116 gr.
Gelatine		
First boiling	. 4·92 gr.	5·46 gr.
Second boiling	. 4·84 gr.	4·54 gr.
Peptone .	. 4·8 gr.	5·58 gr.
Undigested residue	. 0·8 gr.	1·42 gr.
Total	19·04 gr.	21·086 gr.

It will be noticed that the total solids in the electrolysed tumour are rather more than in the standard. This is exactly what one would expect, the electricity having decomposed the more readily acted on, *i. e.* the fluid ingredients to the extent, as we saw, of a little over 2 per cent. However, this would not account for the whole difference, and doubtless the tumour was originally a more solid one than those taken as a standard of reference. Allowing this difference by adding about 10 per cent. to each result in the column of the standard tumour I note first that the extractives are increased, but the fat greatly diminished, to less than a quarter indeed. This latter interests me greatly because Dr. Apostoli has stated that as the tumour diminishes, the fat of the abdominal walls, as estimated by calipers, increases, so that it seems possible that a certain amount of fatty change being constant in tissues, the electricity may decompose that into some form easily carried away by the circulation to be redeposited after another chemical change as fat. This would make a cycle somewhat similar to what occurs in the liver in the transformation of sugar

into glycogen, and this back again into sugar. I thought there was a volatile oil developed in the electrolysed tumour, though I did not estimate it exactly. The comparative diminution of gelatine from the second boiling of the electrolysed tumour is suggestive, remembering the greater ease I experienced in tearing up this mass. As to the increase of one half of undigested residue, I can offer no reliable suggestion.

The actual loss by electrolytic decomposition in a uterine fibroid seems but small, apparently being chiefly its fluid constituents, fat, and to a less degree its connective-tissue element; it appears, therefore, that the influence of galvanism on a fibroid must be sought in causes other than chemical decomposition.

Through the kindness of Dr. Cook, I have been able at the Hampstead Infirmary to observe the action of the two poles on some very chronic ulcers, the granulations of which I considered were representative of the granulations of a degenerative endometrium. I may say at once that the treatment adopted seemed of decided service to the patients, but what I wish to note is the difference visible in the action of the two poles. The application of the positive to the ulcers took off the glaze from the granulations, and presented a dry, pale, and depressed surface, whilst the negative, even where applied on a very anæmic wash-leathery patch, caused the swelling up of little bumps of swollen granulations which looked like little bits of red-currant jelly sprinkled on the surface; this occurred with a strength of 50 ma. for about two minutes. The action indeed of the positive and negative poles respectively as hæmostatic and hæmorrhagic is well appreciated, but what I would insist on is that puncture by the negative pole or its intra-uterine application acts not so much as a solvent as an incomparable counter-irritant or derivative. The principal effective cause, however, is to be found, perhaps, neither in electrolysis nor in counter-irritation, but in increase of arterial tension with diminished blood supply.

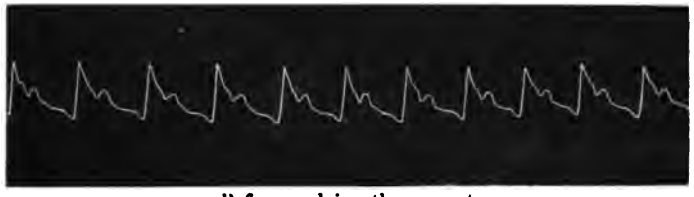
In order to ascertain the effect of galvanism on the circulation, I had a current of 65 ma. passed from my left upper arm to the forearm above the wrist so as to enable tracings to be taken with a Dudgeon's sphygmograph. During the application the sensation was one of burning and pricking, not very unpleasant. I attach a series of sphygmograms taken before, during, and after the experiment which demonstrate plainly an immediate rise of arterial tension. This occurred not only in the arm acted on, but in a less degree in the right pulse, and this increased tension lasts for some time after the current is turned off.

The temperature in the hands fell, the left from 96·2°, so much as to be unregisterable by an ordinary clinical thermometer, whilst the right fell from 96° F. to 95·4°. In turning off the current I experienced convulsive twitchings in the arm and hand, and a sensation of pins and needles down to the tips of the fingers.

These observations were recorded by Mr. McOscar, on whom I repeated the experiment with results precisely similar to those I experienced. His pulse, usually 68, was reduced to 52; the same increase of arterial tension was observed. The right hand fell from 98° F. to 95·2°, and in the left from 98·4° F. to an unregisterable point. The hands perspired profusely.

I omit speaking of cutaneous sensibility, muscular power, &c., because they have not an obvious bearing on the subject in hand. With regard to the sensibility to pain, however, we noted that during the passage of the current, a pressure of four pounds on the lunula of the thumb by means of a blunt-edged guillotine gave as much pain as a pressure of five pounds applied before and after. Mr. McOscar reports himself as having felt particularly well and bright for some hours after the experiment.

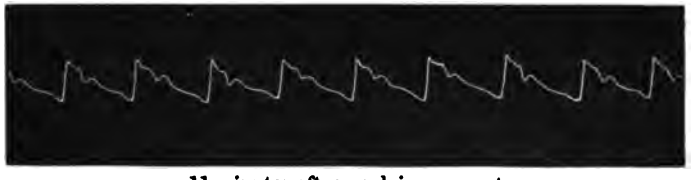
Comparing these results with the effect observable in using intra-uterine applications of either pole with attachment of the other to spinal and abdominal plates one observes a precisely similar series of events. The pulse is



Before applying the current.

45 ma. intensity. 55 ma. intensity.

5 minutes after stopping current.



11 minutes after applying current.

84 minutes after stopping the current.

slowed—the tension in the radial pulse is increased, especially just after each augmentation of the current-intensity, and indeed in one case became so high that the slow rise, the broad top, the sudden fall made it almost like a tracing upside down. In another case it became very tremulous. This accounts for the faintness which is occasionally experienced by patients, and might be a source of danger in the case of one suffering from fatty or otherwise incompetent heart. A symptom of which patients sometimes complain is the shock which occurs mostly with an oscillation of the needle of the galvanometer, but without any intentional alteration of the current strength. I think it must be due to the tension in the vessels altering the nutrition, and so the conductility of the tumour, with the result that there are spasmodic variations in conductility which so occasion shock.

A simpler explanation would be the shifting of the electrodes, but I have not been able to prove it. Generally, perhaps invariably, the patient complains most of pain in those seats where she has pain in the ordinary way, and this is illustrated by the pressure experiment already noticed. On turning off the current, the patient frequently complains of a shock extending down the sciatic nerves to the toes.

As to the temperature, in a dozen observations on superficial temperatures (hands, calves, inner side of ankle, in seven cases), there was a fall in both limbs, in one case a rise in both, in two cases a rise in one limb and a fall in the other, in one case a rise in one whilst the other kept constant. The fall varied from 0·6° F. to 5·2°, and averaged 2·3°, the rise varied from 0·4° to 3·5°, and averaged 1·3°. The internal temperatures, judged in the mouth, vagina, or rectum (for I found them very constant in those cases in which I took two internal readings at once), showed in ten observations, three cases of rise, averaging 0·6°, five cases of fall averaging 0·26°, and in two the internal temperature remained constant.

Case of Metrorrhagia due to Subinvolution and Chronic Salpingitis.

Before the application.

130 m.a. Galvano-positive intra-uterine application for five minutes.

10 minutes after the application had ceased.

All taken under a pressure of 5 oz. at the right wrist.

I am unable to discover any relationship between the direction of the current and the rise or fall of the temperature, or the mutual relation in which internal and external temperature may stand.

I append a table of the results obtained by volumetric analysis of eight samples of urine collected before the electrical treatment,* with corresponding estimation after it. Striking the average, we note that the specific gravity is very little altered—

1015·6° before, 1015·1° after.

The acidity is diminished one third—

7·7° before, 5·0° after.

* Note F.

The urea is likewise diminished about one tenth, from 1·49 per cent., to 1·33 per cent. The chlorides are, however, increased to the amount of 23·4 per cent., *i. e.* from 6·4 to 7·9, whilst the phosphates show a remarkable diminution from 13·5 to 7·2, or nearly one half.

Initials.	Date.	Time.	Quantity.	Sp. gr.	Acidity.	Urea per cent.	Chlorides.	Phosphates.
E. A.	Feb. 8	Before	44 cc.	1023	2	1·95	10·7	17·6
		After	105 cc.	1012	4	0·91	6·3	7
E. E.	„	Before	80 cc.	1020	7·2	1·45	9	10
		After	36 cc.	1021	4·9	1·92	9·5	5
A. H.	Feb. 2	Before	100 cc.	1011	3·5	0·97	4·5	10
		After	...	1016	0	1·3	10·5	9·6
H. D.	„	Before	...	1016	13·3	1·92		
		After	...	1011	10	1·2		
S. B.	Feb. 9	Before	16 cc.	...	...	1·85	11	
		After	...	...	...	1·53	12	
E. E.	„	Before	...	1012	3·5	0·72	2	
		After	...	1018	6·2	1·63	4·7	
H. D.	„	Before	...	...	11·7	1·48	6·5	13·7
		After	...	1015	2	1·24	8·8	4·3
				1013	2·5	0·99	6·5	3
M. A. C.	„	Before	...	1012	12·8	1·23	1·2	16·4
		After	...	1013	8	0·96	3·5	10·3

Only on one occasion did I notice albumen in urine examined after an application, and I am not in this case sure it arose from the treatment, as the urine had not been tested just before, though on examination a couple of days later it showed no trace.

On one or two occasions there was a marked increase in the flow of water, but not in other cases.

The diminution in the urea appears associated with the high arterial tension, as in granular kidney, whilst the increase of chlorides and diminution of phosphates would seem to indicate some rearrangement of the relations between the fluid and formed elements of the tissues, the chlorides being predominant in the former and the phosphates in the latter.

To sum up, therefore, it appears from these experiments that galvanism acts on a fibroid in a threefold

manner:—1st, to a certain degree by actual electrolytic decomposition of its substance, especially of the fluids and the fat; 2ndly, as a strong counter-irritant or derivative at the negative pole—the positive acting as a powerful hæmostatic, not only by coagulating any albuminous secretion, but also by astringing the vessels; 3rdly, by the development of increased tension in the vessels and so diminished nutrition of the tumour, together with an abstraction of the fluids, as evidenced by the increased secretion of chlorides.

Further, it appears that the chemical action of the current extends far beyond the point of application of the poles, suggesting the probability that by the coagulative action of the positive pole we may be enabled to cure malignant deposit which is beyond the reach of the knife, the positive pole apparently exerting its influence especially on cell-elements.

Appendix.

Note A. Apparatus.—The electro-motive force in these experiments was supplied by a battery of thirty-six quart Leclanché elements, the internal resistance of which is lessened by the zincs surrounding the porous pots. The electrodes to the skin were sheet-lead plates covered with flat sponge and wetted with warm salt solution, and one applied both to the spine and abdomen, the size being respectively $13 \times 3''$ and $9 \times 3\frac{3}{4}''$.

Another very useful cutaneous electrode, a modification of a suggestion of Dr. Routh's, is made of two thicknesses of ironing cloth well wetted through with modelling clay and protected by mackintosh. The internal electrode is of aluminium, but apparently, owing to impurities in the article of commerce, it seems best to use platinum for positive application.

Note B. Polarisation.—It would be out of place here to give a full account of all the experiments made to try and

ascertain the exact meaning of the phenomenon described; the principal ones will suffice. The apparatus consists simply of an inner vessel, the bottom of which is of animal membrane (bladder), and an outer containing vessel; into these two, saline or acid and alkaline solutions are poured, and the effect of the current on the galvanometer noted. The acid solution was 1 per cent. of hydrochloric acid, and the alkaline a neutralizing strength of caustic soda, the electro-motive power two Leclanché cells.

If both vessels contained acid there was a little tendency to increased resistance, which was greatly exaggerated if both contained alkali. If one vessel held alkali and one acid the resistance was less, and if the electrodes were interchanged *without wiping them* a rise of current intensity was noted (from 40 to 50).

2ndly. If whilst both solutions were acid or alkaline, the current direction was reversed, very little alteration took place, but if the positive being in the acid and the negative in the alkaline, or conversely, a reversal was made, the index immediately fell rapidly, the bubbles of oxygen in the former case being seen clinging to the positive pole. Simply raising from the fluids and re-inserting the needles caused a rise of intensity, but if they were wiped part of this was lost.

3rdly. Non-polarisable electrodes of glass tube plugged with potters' clay and holding a strong solution of sulphate of zinc, into which the conducting wires dipped were now employed with this result, the whole battery of thirty-six cells being in action. The positive in the acid and the negative in the alkali showed a current rising from 70 to 80; on reversing, it registered 85, but fell to 70.

If the positive was in the soda and the negative in the acid a decreasing current was noticed, 100 ma. to 60; on reversing it rose to 100—105.

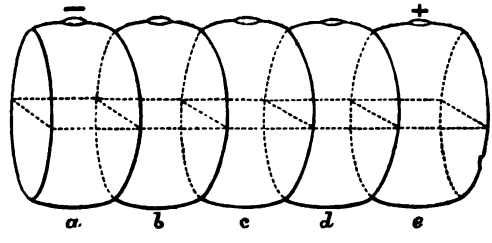
If both contained warm saline solution the galvanometer showed an ascending current, 120, rising in three

minutes to 135, on reversal a current registering 140—145—140. If both vessels contained acid the index marked 105, rising to 115, which on reversal continued to rise from 115 to 125. If both vessels held alkali then the numbers noted were 75—80—73 ma. in twelve minutes, which on reversing first rose to 150, but went down to 45 in the course of thirteen minutes.

From these experiments one gathers, in opposition to the usually accepted view, that increase of current intensity on reversal of the direction is due to polarisation, that so far as the respective gases are concerned, they are a hindrance to the reversed current, but the chemical affinities of the acid and alkali develop an accession of power.

Note C. Interpolar electrolysis.—In addition to the observation made in this paper as to the extension into the substance of the tumour of the acid and alkaline reaction respectively, it seemed desirable experimentally to determine this question.

Five napkin rings were taken, and so arranged as to make five chambers separated by bladder. Into each of these a 10 per cent. acidulated solution of Pot. Iod. was first put, and a current passed varying from 240 to 150 ma. for thirty minutes. *A. b. c. d.* were all alkaline,



diminishing in intensity from *a*. *E.* was strongly acid, and contained much free iodine. A second experiment with the same apparatus was made, and 10 c.c. of a 5 per cent. solution of Pot. Iod. were placed in each chamber, with the result that after the passage in the same direction

as before of a current of 160—175 ma. for thirty-two minutes—

From	*a.*	one recovered	9·4 cc.
,,	*b.*	,,	10·2 ,,
,,	*c.*	,,	9·5 ,,
,,	*d.*	,,	10·1 ,,
,,	*e.*	,,	10·8 ,,

Tested volumetrically 10 c.c. of the solution corresponded to 18·75 c.c. of silver nitrate solution, and one obtained this result from each chamber.

a. 15·35 (This is probably an exaggeration owing to imperfect neutralization of alkali).

b. 15·25.

c. 16·4.

d. 16·75.

e. 21·3.

This experiment would seem to show that in each chamber electrolytic action had taken place with an attraction of the iodine to the chamber in which was the positive pole.

For further confirmation the experiment was repeated; a current of 155—115 ma. being passed for one hour twenty-four minutes, with the result that of the 10 c.c. fluid, and 18·75 representing iodine as above—

From	*a.*	one received	8·7 c.c. solution,	and	13·2	iodine.	
,,	*b.*	,,	(not measured)		,,	14·2	,,
,,	*c.*	,,	8·2	,,	,,	11·2	,,
,,	*d.*	,,	9·2	,,	,,	15·35	,,
,,	*e.*	,,	8·9	,,	,,	32·5	,,

There was free iodine in *both d. and e.*, the other compartments *a. b. c.* were alkaline in the proportion roughly of 5, 3, and 1. It will be noted that in both experiments the central compartment suffers very much, both in loss of fluid and loss of iodine.

The experiment recorded above does not bear out the idea of an attraction of fluid to the negative pole (endosmosis), nor did a special experiment bear this out; a long narrow tube capped with bladder and enclosed in another

vessel, both filled with saline solution, at the end of half an hour exhibited a slightly lower level in the tube containing the negative pole.

Note D. Contraction of myofibroma.—The manner in which this experiment was conducted is recorded, although the result is probably not trustworthy. It was about the last observation made, and should have been the first.

A small tumour attached to German silver wire electrodes was introduced into a pipette consisting of a bulb, a wide-mouthed limb, and a narrow tube, and the remaining space being filled with oil, *i. e.* a non-conducting material, contact was made with negative results as described.

Note E. Microscopic appearances.—The portions removed for this examination were hardened in 2 per cent. solution of bichromate of potash, logwood being the staining agent employed.

Around the space left by the positive needle is a line of granular black pigment, most developed at one end, doubtless that to which the current was directed. Immediately bounding this is a narrow zone, fairly well stained, fibrillated but without nuclei, and still more external is a broader zone, which at the end already noted for the larger development of pigment, passes into a broad band. In this area wavy bundles are still visible, but there is absence of stain and of nuclei. Beyond this the section presents the ordinary character of myofibroma.

The preparation from the negative pole shows some marked differences. The pigment is less plentiful, the nuclei do not disappear, but it is the fibrous element which suffers most; the staining is not affected in any definite manner, so that the course of the current is less readily traced. It appears then that the electrolytic action of the positive pole is most exerted in the cellular structures, and of the negative in the formed elements.

Note F. Nature of cases.—The patients on whom the

observations were made were treated by galvano-puncture (negative) for fibroid tumour, intra-uterine negative applications as a counter-irritant in salpingitis with pelvic swelling, and intra-uterine positive applications for metrorrhagia. Although in some respects the course adopted of using both spinal and abdominal external electrodes seems a reasonable one, yet it may have complicated the results as to urinary excreta, &c. To obviate this error a descending current was passed from the spine to the abdomen of 100 m.a. for about a quarter of an hour.

For three or four days previously the breakfast had been restricted to bread and marmalade and tea, and the urine passed between 8 a.m. and 12 noon collected and examined separately from the remainder of the day. About noon on the fourth day the application named was made, with general results precisely similar to those already recorded; at 12.30 p.m. there was a copious discharge of urine, and again at 1.15 p.m. The analyses are as follows:

Date.	Time of day.	Quantity.	Sp.gr.	Acidity.	Urea %.	Cl.	P_2O_5.	SO_3.	Remarks.
Feb. 1	8—12 a.m.	167 cc.	1029	9	3·3	10·5	19	40	Lithates. Urine froths very much.
1—2	12—7.30	1197 „	1022	9·3	2·45	9·5	21	38·5	
2	7.30—12	470 „	1012	6	1·47	6	7	7·5	
2—3	12—8.30	830 „	1027	18·2	2·92	10	24·7	37·7	Lithates.
3	8.30—12	185 „	1025	7·5	2·75	11	17	16	
3—4	12 noon to 2 a.m.	957 „	1016	14	1·45	6	19·5	12	
4	8—11.30	295 „	1010	3	0·93	3·7	7·3	11	
*	12.30	320 cc.	1009	0·9	0·32	2·5	5·2	4·3	No albumen in any specimen.
	1.15	83 „	1013	0·5	0·8	6·5	7·5		

Dr. HORROCKS remarked that a most important admission had been made by Dr. Steavenson, namely, that electricity possessed no specific virtues. Its usefulness depended upon its action as a stimulant, caustic, or cautery. If this were admitted, the question was narrowed down to a comparison between the different forms of stimulants, caustics, and cauteries, including electricity. Electrolysis was an elegant method of applying this treatment, but it had the great drawback of requiring a complicated apparatus, which was not only heavy but also liable to get out of order. The reduction of the weight of the battery by diminishing the size of the cells was at the expense of its constancy, for it was well known to those who had practical acquaintance with the subject that the larger the cell the more constant it was. Stöhrer's battery, used in Apostoli's method, required two men to carry it. Hence, in spite of its elegance as a therapeutic agent, medical men in general practice would not be induced to use it unless some apparatus were invented that would be readily portable in an ordinary bag, easily worked, inexpensive, and not liable to get out of order. Until such time had arrived, Paquelin's cautery, acids and alkalies, and the knife, would continue to hold the field. In hospitals, where every help could be obtained, it was quite proper to continue to use electricity in its various forms, and there was no doubt about its value in suitable cases, and from a large experience he was inclined to agree with the author of the first paper, that electricity had no specific special mysterious action, such as was believed by the general public, but that it was of the same nature as, and comparable with, other forms of caustic and cautery. At the same time our knowledge was not sufficiently great about either galvanism or faradism to dogmatise, but he might mention that in the treatment of paralysis the same good could be obtained by friction of the affected parts, if the muscles were made to contract and the parts made to receive more blood by the congestion produced. He called attention to the uselessness of speaking about the number of cells used in a given case. Ten cells in the evening were quite weak in comparison to the same ten cells in the morning, if they had been used during the day; again, cells newly charged and in good working order were much stronger than the same cells which had been charged for some time and not in good working order (polarisation, &c.). Hence it was absolutely necessary to employ a means of measurement, and this was done in various ways, but a galvanometer was the best way at present known. This, however, introduced another complication and expense. He would confine his remarks to this comparison between electricity in the form of electrolysis and other agents at our disposal, and would not allude to the various diseases mentioned by the writers of the papers, because he thought all would admit the usefulness of the electrolytic

treatment in those diseases, but the question was, Had we not just as efficacious and more easily applied remedies at our disposal?

Dr. AUST LAWRENCE was testing the whole subject on precisely the lines laid down by the authors; he asked Dr. Steavenson for information on some details in treatment. He also mentioned how important it is to make allowance for what rest in bed or purgatives will do, and stated that we must not put all the benefit down to electrolysis when some of it is due to the altered condition of an in-patient as compared with an out-patient. He had had cases where this was most important to remember. He considered that it did not require a very highly trained electrician, as anyone could with a little help and study master the details enough to carry out the treatment, but he considered that a fair knowledge of gynæcology was indispensable.

Dr. HERMAN said that the utility of electricity in the treatment of disease could be ascertained by clinical observation only, not by *a priori* argument. The effects claimed for electricity were of two kinds,—the caustic or destroying action, taking place at the spot to which the pole was applied, and the electrolytic action, *i. e.* the chemical changes supposed to be effected by the current in the tissues through which it passed. As to the disadvantages of the electric cautery, its cumbrousness, &c., he agreed with what had been said by Dr. Horrocks, and these disadvantages must be balanced against the advantages claimed for it in the papers read this evening. It did not follow that, because certain chemical changes take place in a fluid, or in a piece of dead tissue, when a galvanic current is passed through it, therefore similar changes must take place when the current is passed through a part of the living body. And even if it were taken for granted that the current did produce these chemical changes in the living body it did not follow that those changes were permanent. A course of treatment such as a jockey underwent to reduce his weight produced chemical changes in the body far greater than any electric current had ever been shown to produce, but the effect of these changes was soon removed by a few weeks of ordinary diet. The only way in which the therapeutic advantages of electricity could be demonstrated was by comparing cases of disease treated by electricity with cases of a similar kind treated in other ways or left untreated. He therefore thought that the most instructive parts of the communications now laid before the Society were the cases reported by Dr. Drage and Dr. Gibbons, and he should confine his remarks to them. Dr. Drage related three cases of cervical erosions cured by electricity. Now, it was a little curious that these cases should have come from St. Bartholomew's Hospital, because the distinguished obstetric physician to that institution

(Dr. Matthews Duncan) in his published clinical lectures on the diseases of women, tells the students that if they do not cure a cervical erosion within two months they had better leave off treating it. Dr. Drage's cases were under treatment, two for three months, and one for four months. These cases, therefore, did not show that the electrical treatment of cervical erosions was any improvement upon the methods in use at St. Bartholomew's before the introduction of electricity. He (Dr. Herman) thought that most who had had practical experience in the treatment of cervical erosions would agree that the date laid down by Dr. Duncan was well outside the time within which improvement was usually evident. Dr. Gibbons's patients were to be congratulated upon the improvement which resulted from his treatment of them. But might not this improvement have been simply due to the complete rest and the appropriate diet, &c., which patients in a hospital enjoyed? It was peculiarly difficult to judge of the results of treatment in hospital of the minor diseases peculiar to women, owing to this fallacy. If a man of the class from which hospital patients were drawn was advised to go home and rest in bed, and he did so, the aim of that part of the treatment was usually attained; but in the case of a woman of that class her work was in her home, and rest was impossible unless she was taken from her home. To this was largely due the great benefit that followed treatment in hospital. No conclusions ought to be accepted as to the results of treatment carried out in hospital unless this possible fallacy had been remembered. Now, there was not one of Dr. Gibbons's cases in which any information was given as to the course of the case after leaving the hospital, and it was possible, and in some of the cases probable, that all the symptoms might have returned within a few weeks. He noticed that in one of the cases a urethral caruncle had been destroyed. This took two applications of electricity, one of them under anæsthesia. By the older methods one operation was usually enough. For these reasons, although admiring the diligence with which this new method had been investigated, and the candour with which the results had been related, he did not think that the prognosis of cases such as those detailed in the papers would be much modified by the introduction of their electrical treatment.

Dr. WILLIAM DUNCAN thought that much more carefully recorded clinical experience of the use of electrolysis in disease of the female pelvic organs is necessary before a definite opinion can be formed of its value. He had for the last year used it in several cases of uterine myomata, and in those where the chief symptom was metrorrhagia, with marked benefit. One case he had seen that morning proved the immense relief afforded by electrolysis properly applied; the woman when admitted was blanched to a degree, and had a fibroid reaching up to the

umbilicus; when discharged from hospital all metrorrhagia had ceased, her periods were of four days' duration, and the tumour was markedly diminished in size, thus showing that the action of the electricity was much more beneficial than that of a cauterising agent; the woman is now in perfect health, and has completely lost her exsanguine appearance. Dr. Duncan hoped at a future period to publish (in conjunction with Dr. Pasteur) full notes of each of the cases.

On the motion of Dr. PLAYFAIR, seconded by Dr. HEYWOOD SMITH, the discussion was adjourned to June 21st.

SPECIAL MEETING.

JUNE 21st, 1888.

JOHN WILLIAMS, M.D., President, in the Chair.

Present—32 Fellows and 2 Visitors.

ADJOURNED DISCUSSION ON ELECTROLYSIS IN GYNÆCOLOGICAL PRACTICE.

Dr. PLAYFAIR said that he had moved the adjournment of the debate since few subjects of recent years had more aroused the interest of gynæcologists, and it obviously was one which called for much serious study, and was admirably suited for discussion in the Society. If electrical treatment was found to possess only a small portion of the merits which had been claimed for it, then certainly a most important advance in gynæcological work had been made. Before proceeding to state the results of his own work and experiments he would beg the permission of the Society to make one or two preliminary remarks.

In the discussion which had already taken place at the last meeting, as well as in some of the letters and articles in the journals, a good many adverse criticisms had been made. It was a curious thing that, so far as he had seen, these were entirely based on theoretical grounds, and on mere secondhand and hearsay evidence. So far as he knew, everyone who had actually worked on the subject in the way laid down by Dr. Apostoli, if he could not speak of it in the same enthusiastic terms as that gentleman, was at least satisfied that it was a treatment powerful for good in certain cases, and well worthy of careful study,

while he had not come across a single adverse criticism from anyone who had taken the trouble to give the matter personal trial and investigation. For example, at the last meeting we were told that the positive currents could only act as a caustic, a very doubtful assumption that one caustic was as good as another, and therefore this was not worth trying. An esteemed friend of his, a distinguished operator, had written to the journals to say that for various theoretical reasons he believed electrolysis could not do any good, and that it must be dangerous, and ended by saying that he did not intend to try it, or in other words that if he had patients suffering from hæmorrhagic fibroids he did not intend to give them the benefit of a treatment which one of the most successful abdominal surgeons in the world had publicly stated to have been found so useful that he should consider it equivalent to a criminal offence if it were not tried, and which had induced a man of his enormous experience and success to abandon hysterectomy altogether. Against arguments such as these he was almost tempted to say the very walls around us should cry out. History was repeating itself, for had it not been proved over and over again from these very benches down to the very ground, with the most incontrovertible theoretical arguments, that ovariotomy and abdominal sections generally were absolutely useless, never could succeed, never ought to succeed, and that the "belly rippers," as they were called in this very room, ought to be sat upon and generally annihilated? And so it would be with those who were giving this treatment a fair and unprejudiced trial if some of its critics had their way, but he ventured to think that the day had gone by when an important topic could be burked by the mere weight of theoretical opinion. If the theory could be shown to be useless by those who had tried it, by all means let it be done, and the sooner the better. But what we wanted were facts, not theories, and if the treatment was found to have the good results attributed to it, so much the worse for the

theories. For his own part he had been carefully trying for the best part of a year to put this subject to the test of clinical experience both in hospital and private work. He had not as yet published his results because he had not yet made up his mind, and because sufficient time had not elapsed to enable him to test the permanency of such results as he had obtained; but still he had sufficient evidence to satisfy him that the agent had great power, although much was yet required to be learnt with regard to it. Before saying something of his experience he wished to say a word as to another contention that had been made. In the paper we had had from St. Bartholomew's Hospital it was incidentally mentioned that the cases had been sent for treatment to the electrical department, and from other sources he had learnt that this course was always adopted there. It certainly surprised him to find the eminent gynæcologists of St. Bartholomew's appearing as disciples of Mr. Lawson Tait, who was the chief upholder of the plan,—a character somewhat new to them. Against this way of treating cases he must enter a strong protest. He considered it quite as reasonable to contend that ovariotomies should be entrusted to the cutlers who made the instruments used. Such difficulties as existed were purely gynæcological. The manipulation of the electrical apparatus in his own cases he entrusted to the students or residents in the hospital, and to a nurse in private, while the passage of the sounds and intra-uterine electrodes required much experience in gynæcological work, which few electricians could possibly possess. If it became general to send patients to them he had little doubt that before long a body of evidence would be procurable as to the dangers of electrolysis which would satisfy its most determined opponents. For his own part he always contended that a man should do in medicine or surgery just what he thought himself capable of doing. If, therefore, any electrician had taken the trouble to acquire the necessary skill in gynæcological manipulations, as he had not the slightest doubt that Dr.

Steavenson, for example, had done, by all means let him treat these cases, but it must be *quà* gynæcologist, not *quà* electrician.

Of course he could not venture to trespass on the time of the Society by a detailed report of the cases he had treated, but should confine himself to a few remarks as to the results in some of the chief varieties of uterine disease in which he had used electricity, premising that he had not used it in anything like the number of cases he might have done, but only in those in which it seemed to him most likely to prove of service.

Firstly, with regard to the hæmostatic effect of the positive pole, which was one of its most important applications, he was satisfied that it sometimes acted most powerfully, and, so far as he knew as yet, permanently, in arresting hæmorrhage, and, as might be expected, in others it did good, but did not prove thoroughly effective, while in only one case was he able to say that it had done no good at all. Take the following as fair examples.

1. A case of *hæmophilia* in a woman, aged 27. Had been a bleeder all her life, had suffered from hæmorrhages of various kinds, epistaxis, melæna. Latterly much prostrated from uterine hæmorrhages, varying from ten to fourteen days in duration, occasionally as much as six weeks. No obvious uterine disease. Four electro-positive cauterisations. Hæmorrhages so much lessened that patient was able to do her work, which had been quite impossible, and when last heard of had gone to America.

2. A married woman, aged 34. Incessant hæmorrhages. Twice in hospital, when the uterus was dilated and examination made under an anæsthetic. Had been plugged as the only means of arresting the hæmorrhage on more than one occasion. There is a considerable mass of lobulated fibroid growing from left side and back of uterus, about the size of three large oranges; cervix displaced forwards behind the pubes. Sound passes three and a half inches. This patient was seen in Dr. Playfair's own house early in April, and he advised her coming into

King's College Hospital. Before she could be admitted she was seized with an intense flooding. The house physician saw her in her own house, plugged the vagina, and she was brought to the hospital almost moribund from loss of blood. When the plug was removed the bleeding recommenced. An electro-positive cauterisation of 80 milliampères was at once made, and the hæmorrhage ceased. Five or six more were made of 200 milliampères, and for about a month she was under observation no more bleeding had shown itself. She then insisted on leaving, promising to return if flooding recurred, but has not yet done so.

3. A lady, aged 54, who has a mass of lobulated fibroid reaching to the umbilicus. Had been losing profusely without cessation for three months; previous to that hæmorrhages profuse, but with intervals of fourteen or fifteen days. Twelve applications of 200 milliampères. For five weeks there has now been no loss at all, and she has left immensely bettered in every way.

4. A lady whose case had been known for seven years. She has a mass of fibroid reaching above umbilicus. The sound passes four and a half inches. The hæmorrhages have been steadily increasing in severity, and were latterly getting so severe that hysterectomy had been proposed but negatived. This patient was treated in October and November, when she went abroad. She writes last month, "I have been steadily getting better. My periods only last six days, and I can do anything that anyone else does, except play tennis and dance."

These cases have been taken almost haphazard, and they are sufficient to prove that the hæmostatic influence of the electrical current is at times strong and well marked. Many more have been treated with results quite as good, and it may safely be said that in two or three cases at least, a year ago the removal of the uterine appendages would have been advised.

In none of these cases could the result be attributed to rest or any other accidental cause. The private cases

were treated at a nursing home, and were never laid up, returning to their own residences an hour or two after the application, and even the hospital cases were allowed to get up and go out. In one bad case, no good at all followed, but it was treated under very unfavourable circumstances as the patient came some forty miles by rail for each application, and returned home next day. In one other case the improvement seemed to have been only temporary; in this also the conditions were very unfavourable.

Dr. Playfair had only treated two non-hæmorrhagic fibroids by puncture and the negative current, in the hope of reducing their bulk. He believed this to be the most questionable application of electricity, and the one most likely to be dangerous. Moreover, there were very few non-hæmorrhagic fibroids which called for or justified treatment at all. In both his cases a large mass was impacted in the pelvis, and caused very serious pressure symptoms. In one of these the tumour had practically entirely disappeared, but with a very considerable amount of constitutional disturbance, so that he could but regard the result as of doubtful advantage. The second caused so much pressure that for long the patient required the catheter. The tumour had so much lessened that this was no longer required, and she writes that she feels quite well and comfortable.

Secondly, there was a considerable class of cases in which the negative current was used for severe dysmenorrhœa, membranous dysmenorrhœa, and severe uterine catarrh. Here his results had been almost uniformly successful, were sometimes most remarkable, and he felt quite satisfied that the electrical treatment of these cases was a very great advance in gynæcological therapeutics.

Take, for example, the case of Mrs. B—, the wife of a medical man, aged 24, married two and a half years. No family. Periods always intensely painful, requiring her to go to bed, and they had been so since

their commencement. In the intervals she is quite well. She has a conical cervix and a minute pin-hole os. Three applications of the negative pole were made, one of 50, two of 100 milliampères. This was in November last. In March she writes, "I am glad to be able to tell you that my periods are now entirely free from pain."

Again, E. J—, a servant girl, aged 27. Periods have always been so painful that she has always to go to bed during menstruation; incessant vomiting accompanied them, and on this account could not do her work. Has seen many doctors for the past six or seven years, but has got no relief. First seen on January 21st. Three applications of the negative current, 50, 60, and 100 milliampères. The next period, beginning February 20th and lasting until the 25th, was reported as being nearly free from pain, there was no sickness, and for the first time for many years she did not lie up. This improvement has continued since.

Other cases, more or less similar, could be mentioned if time permitted. So with cases accompanied by profuse uterine catarrh. He had found the most marked and rapid improvement, which he had never seen equalled by any other method of treatment. Of the value of the electrical current in this class of case he had no sort of doubt. Let him mention one only as an example.

Mrs. G—, multiparous, married five years, aged 27, had been under most of our prominent gynæcologists, and had undergone much treatment for dysmenorrhœa, uterine pains, and profuse glairy discharge. Amongst other things incision of the cervix had been performed.

When seen in November she had been six months on her sofa, and had been seen twice weekly all that time by an eminent physician. The uterus was large, very tender, the cervix abraded, with a large amount of tenacious muco-pus oozing from it.

In November four applications of the negative current. On December 15th she wrote as follows: "I feel very grateful for having been cured so very quickly. I had

given up all hopes of ever being well again, and now I am glad to say the discharge has quite stopped, and I am feeling better than I have done for many years." This patient had not been seen since, but for the purposes of this discussion I wrote to inquire how she continued, and on June 10th she replied, "I am glad to say that I have been quite well during the past five months, not having any of my old troubles, and being altogether better and stronger than I was before the electricity."

Thirdly, there were various other minor applications of electricity on which it was impossible in the limits of this discussion to touch, such as its use in promoting the absorption of inflammatory deposits, the use of the interrupted current to relieve pain or to cure amenorrhœa. In the latter case sometimes he had found it very useful, as in one patient who had not menstruated for seven years, but who had commenced to do so, and had since done so regularly after three intra-uterine faradisations. In other cases of the same kind it had failed to do good.

He hoped that he had not trespassed too long on the patience of the Society. He was desirous of showing, by narrating a few clinical facts which could not be controverted, that we had to deal with an agent occasionally capable of doing much good. Like all powerful agents, beyond doubt if rashly, injudiciously, and unskilfully used it was also capable of doing much harm. That was not a reason for rejecting it as a therapeutic agent, but it certainly was a reason for studying its effects carefully, for settling its indications, and learning, if possible, to avoid its dangers. He trusted that this discussion might prove of service in some of the moot points connected with it.

Dr. Inglis Parsons said it was impossible to discuss as a whole the treatment of fibroid tumours by this method. The results of treatment would vary according to the position, and also according to the structure of the tumours. For instance, an intramural fibroid would not be acted upon so quickly or so effectively as a submucous fibroid, because

the electrode could not be brought into direct contact with it. Electrolysis, he had found by experiment, occurred only at the poles, and the free acids and alkalies resulting from it also acted locally. The age and structure of the tumour were also important. If fibrous tissue predominated very little reduction in size was possible even by puncture, whereas a soft myoma could be disintegrated by puncture, and this could be done when operative procedures were inadmissible. The speaker had treated a case of Dr. Edis in this way. A small platinum needle, insulated to within a quarter of an inch of the end, was passed through the anterior vaginal wall to a depth of one inch. The current only came off in the tumour, the vaginal wall remained intact. The use of the actual cautery in a similar way would lead to the formation of a sinus, whereas by this method the slight prick made in the vaginal wall closed up at once, while at each sitting a large piece of the tumour was destroyed. The patient left the hospital in February last with the tumour one third its original size. She had been seen twice since, and it had remained unaltered. What was left appeared to be fibrous tissue. Her health had remained perfect.

When the electrode could not be brought into contact with the tumour it might still be capable of checking and preventing further growth, and that was quite as important as reduction in size. In the early stages of these tumours there need be no hesitation in applying the current, and so preventing them from attaining a large size. At present a family physician very naturally only advised abdominal section as a last resort on account of its dangers. As a consequence, we were constantly seeing cases reduced to the last extremity, because no medicine was of any avail, and the patients did not like to risk abdominal section.

With regard to hæmorrhagic cases he could not understand why electrolysis stopped the loss in some cases and not in others. He believed it was because the electrode did not touch the whole of the bleeding surface. He

had sent out a case only a few weeks ago that had been curetted, and had every kind of treatment. Bleeding had been going on incessantly for two years. After twelve applications it stopped, and the time for the normal period was ascertained. She had had two periods, with a normal interval and only a small loss.

Dr. BANTOCK said that, notwithstanding the remarks of Dr. Playfair, he was prepared to express his views on the opposite side. Ever since the publication of the graphic papers of his friend Dr. Woodham Webb, papers which had given that impulse to this method of treatment under which it had suddenly jumped into notoriety and under which it even now seemed to be advancing in professional and public favour, he had paid a great deal of attention to the subject and had read well-nigh everything that had been published in this country. He had been on the look-out for some evidence of a more convincing character than had yet been furnished us, and it was with that object he was then present. There had been a great deal of assertion as to what this treatment was going to do, but they had very little evidence of what it had done. The cases brought forward by Dr. Playfair were of the usual stock and failed to convince him of the special advantages of the method. Indeed, they were of so ordinary a character that he could cap every one of them.

A year ago we were told by Dr. Webb that while one of the electrodes was applied over the hypogastrium by means of that filthy mess of potter's clay the other was *always applied within the uterine cavity*. The theory on which the practice was based was the electrolytic, and it was supposed and affirmed that in the case of fibroid tumours of the uterus the beneficial results said to be obtained were due to the electrolytic action of the current upon the tumours. Now, he affirmed that there was not a tittle of evidence in support of the idea of electrolytic action extending between the poles. The evidence went

all the other way. Men had been in the habit of using the electric current for years, even for generations, but always for the opposite purpose,—for repairing, not destroying tissue. Had it been otherwise he could not conceive how the matter could have remained so long in doubt, for the agent would have proved itself of a most destructive character. He had therefore no hesitation in saying that this theory was utter nonsense when applied to living tissue, not the least so because it implied a selection by this agent of the material the operator desired to get rid of.

But Apostoli himself, as well as some of his apostles, have acknowledged the correctness of this view, and through the failure of this method to effect what was intended and expected, have been compelled to resort to another method of a totally different character, viz. that of thrusting one of the electrodes into the substance of the tumour. This reminded him of the practice introduced by the late Dr. Greenhalgh of thrusting the actual cautery into the substance of the fibroid tumours, a practice which had fallen into well-merited neglect on account of the unfavourable results. There was no difference in the principle of these two methods, for they both sought to bring about the destruction of the integrity of the tumour, —it was only a question of degree. And the practice might be said to be founded on the well-known fact that if you once started the degenerative process in a fibroid tumour, that process went on till the tumour entirely disappeared, leaving not a trace behind, contrary to the statement just made by Dr. Parsons. Of this he would give proofs. No doubt it was more dangerous to employ a large and clumsy instrument like the actual cautery than the delicate electrode. But this again was only a matter of degree.

He admitted the caustic action of the current at the poles, but he thought this method offered no advantages over other methods in the treatment of those granulations on which uterine hæmorrhage so often depended.

They had been told that the tumours got smaller under this treatment. Did they mean the tumour itself, properly so called? or did they mean the whole mass formed by uterus and tumour? He had a very decided opinion that this diminution was due to a change in the condition of the uterus itself and not of the tumour, and in support of this view he quoted a case in which he had removed the appendages seven years ago, in which the tumour (the whole mass) diminished nearly one half within three weeks, in which it regained its original size within two months on the return of menstruation, and in which he had been compelled to perform supravaginal hysterectomy three years afterwards. The explanation of this was to be found in the enormous hypertrophy of the uterine walls, which under powerful contraction admitted of this great change. It was not conceivable that the tumour could have undergone such a diminution in the course of three weeks, and so soon regained its former dimensions.

A still more extraordinary and to him incomprehensible statement was this, viz. that although the tumours became smaller they did not disappear. He quoted cases to show that after the removal of the appendages, if the tumours became smaller at all, the process went on to complete disappearance.

It had been said, either by or on behalf of Dr. Apostoli, that a profound knowledge of gynæcology was necessary for the successful application of this method. He did not know whether the President had had the curiosity to read the report of two cases recently published by Dr. Apostoli. Had Dr. Apostoli known that he was dealing with a collection of fluid in the pelvis he would probably have inserted a trocar and cannula, and finished the matter in five minutes instead of several days. But then we should have missed an interesting example of that circular method of treatment which we owe to the imaginative genius of a transatlantic brother; for one of the patients was literally "sent into fits" of delirium. It appeared to him (Dr. Bantock) that profound ignorance of gynæ-

cology was a better qualification for the application of this method than the opposite state. It was perfectly evident that Dr. Apostoli had not the slightest idea of the conditions in these two cases.

Dr. Bantock then said that his opposition was not an opposition to the method *per se*, but to the exaggerated claims that had been set up for it. Was anyone convinced by the cases selected by Dr. Webb from Dr. Apostoli's records of five years' experience? It would take a great deal more than that to convince him. Nor were the cases referred to by Dr. Playfair of a different order; and until the advocates of this method could show better results he should continue his opposition. That there was some good to be got out of the electric current he was perfectly certain, and he had seen at least one most striking case (though, as he afterwards explained, it did not come within the province of the gynæcologist), and so long as he could witness such a marvellous change brought about by any method of treatment he would not refuse to believe in it to that extent, but that result was obtained in a very different way from that of Dr. Apostoli.

There was one aspect of the question that had not been touched upon in the discussion. He referred to the moral aspect. It was well known that this method had become the fashion of the day, and experience taught us that as such it was only too apt to degenerate into quackery. One could not help feeling that it had already assumed that character when we heard of fifteen guineas being charged for a first application, and when he read the list of the various and opposite diseases for which it was recommended we were forcibly reminded of the vaunted virtues of some patent medicine, such as Holloway's or Beecham's, Cockle's antibilious, or Widow Welch's wind pills.

After an interruption by Dr. Playfair he said he was sorry to find that Dr. Playfair took these remarks to himself, and it was unnecessary to give his reasons for that regret. But he could not allow the assertions and exag-

gerated claims set up for this method of treatment to pass unchallenged, and he demanded more specific data and more convincing evidence before he would or could accept it.

At present he had no confidence in the method; he failed to find evidence sufficient to convince him of its utility to anything like the extent claimed for it by its advocates, and while he stood on one side with his mind still open to conviction he was content to allow others to pursue it, provided it was done in a truly scientific spirit and free from that empiricism and imposture which at present characterised it.

Dr. ROUTH stated he was present at a meeting in that room years back, when the uterine sound was held up to execration in the Society meeting then as an instrument capable of frightening a Caffre, and again when Dr. F. Bird was most severely handled for daring to perform ovariotomy. So with the electrical treatment nowadays against and for which plan the most exaggerated statements were made. He also protested strongly against the charge of quackery brought upon those who used it, and this by those who, never having tried it themselves, were quite incompetent to judge of its merits.

Now he (Dr. Routh) believed it was an efficient remedy in many cases. It relieved pain, the positive pole arrested menorrhagia, the negative induced the menstrual flow in many cases of amenorrhœa. It cured very readily cases of subinvolution of the uterus, the positive pole not only acting as a hæmostatic, but causing contraction of dilated cavities. The negative caused dilatation of the contracted passages, as stenosis of the uterine canal and stricture of the urethra. The extent to which the negative pole could dilate the uterine canal had not been sufficiently dwelt upon. In one case in which at first he had great difficulty in introducing the sound, electricity so dilated it that he could get two or three fingers up easily, and so found out the nature of the uterine tumour.

Hoping to dilate the cavity further for operation, he gave ergot, when to his mystification he found that the ergot, instead of dilating, closed it almost altogether, and so arrested all further attempts on his part for that time at least. But electricity got often into great disgrace from errors of diagnosis. Such a case he believed occurred in the Soho Hospital. Here, it was true, the diagnosis was well-nigh impossible. The tumour was simply strangulated in the pelvis and mortified, and electricity was in no way responsible for this misfortune. Lastly, in another society, Dr. Bantock had shown a fibroid which he had extirpated. On cutting the uterus open, it was found that projecting into the cavity were some ten to twenty tumours, some pedunculated, attached to the walls of the uterus, varying from the size of a small marble to a walnut. The case made a perfect recovery, but Dr. Routh thought that if this uterus had been first dilated, and these tumours removed *seriatim* with forceps and curette, that woman might have been cured and retained her sexual organs. He was afraid many cases were submitted to electricity in which a correct diagnosis was not made. Now, as to fibroids, years ago (1872) he had cured two cases of large fibroid by using the electrical cautery then used in the hospital, placing one pole on the back or belly, and the other by a sound *in utero*. In both cases a cure resulted. In one the tumour reached between the navel and epigastrium, in the other it was more laterally placed, but as big as two adult heads. Both were cured. The first had very serious symptoms, like peritonitis, and in less than a month it had diminished one half, and rapidly disappeared. That woman is still alive and without a trace of tumour. The other also recovered; her symptoms were less severe. He saw her a year after. The tumour had dwindled down to the size of a small orange, and this patient he had lost sight of. But in both cases, both internally and externally, the electrical agents made deep wounds which proved very difficult to heal, hence he desisted. Now, however, by Dr. Apostoli's

artist's clay (which after all could be put in bags, and so cease to be so troublesome in handling) we can get this full power, and without pain or producing wounds, estimating our power by a galvanometer; and so effective results without danger were possible.

His first fibroid case just mentioned gave rise to very serious, probably dangerous, symptoms; although she ultimately got well. Two cases mentioned by Dr. Parsons operated upon at the Chelsea Hospital, also were cured by electricity, but also presented these serious symptoms after treatment. Now, why was this? Because antiseptic treatment was not combined. As in post-partum cases, if the temperature rises and fever sets in, the uterus ought to be washed out by iodine or bichloride of mercury or other antiseptic, and these accidents will be arrested.

It could not be denied that by the electric wire you could always limit your application both as to place and time, and exactly. This you could do, for instance, most satisfactorily in those cases of fundal endometritis, accompanied with very tenacious, sticky mucus or pus, where you could not do it through the uterine canal by a caustic which must needs affect the lower part of the canal, and perhaps never reach the diseased part.

He did not deny that many of these fibroids could be cured by extirpation. But then we should remember these women were unsexed thereby.

Dr. CHAMPNEYS said that although a debate on electrolysis was inevitable after the four papers read at the last meeting, the discussion—so far, at least, as regarded successful cases—was altogether premature. The cases which were stated to be successful had not had time to prove their title, and the alleged results were not therefore results at all.

Dr. Playfair had opened the proceedings of the evening by a violent tirade against all who either disbelieved in the benefits, or, still worse, had ventured to express such disbelief, and had taken it for granted that those who did

not believe had had no experience, and did not, in fact, possess the material for forming a judgment,—that they were simply prejudiced and nothing more.

This, however, by no means followed, and it was quite possible that those who did not publish successes in the journals had had some means of forming a judgment, and that the experience was not altogether confined to those who rushed into print.

He had felt bound to give the method a trial, but he was not going to give his results to-night, because he did not consider the time had arrived, but he must say he had not met with the startling successes of which we heard.

Dr. Playfair had stated that he eliminated the disturbing influence of rest by keeping patients out of bed, but he (Dr. Champneys) did not think this was sufficient, for the difference between the hard work of a poor man and the leisure of a hospital ward must surely be equivalent to comparative rest. Fibroids also were liable to extraordinary and rapid variations in size; if a rapid diminution occasionally followed electrolysis it did not necessarily follow that they stood as cause and effect.

He confessed that the cases reported in the papers and related that evening had convinced him of nothing; he had come to learn, and he should go empty away. The effects as shown in the papers on so-called minor gynæcology and in the speech of Dr. Playfair certainly showed no superiority over well-known ordinary methods, if indeed the new treatment was nearly as efficient as the old. On this point Dr. Herman had spoken much to the purpose, and he fully agreed with what he had said.

The testimony in favour of electrolysis was exactly the same as was periodically heard in that room about each new treatment which became the fashion, and which, having had its day, ceased to be.

Dr. Shaw's paper, to which, by the way, no one had even alluded, contained some of the only facts adduced in the course of the discussion. He would like to point

out, however, that double electro-puncture, as carried out in the experiments, did not necessarily illustrate what happened in ordinary clinical cases.

Finally, he should like to refer to several fatal cases of which he had heard, such as deep electro-puncture, followed by prolonged pyrexia with suppuration for weeks or months; puncture to a quarter of an inch, followed by suppuration extending from the tumour to the surrounding organs, and even up to both kidneys; intra-uterine electrolysis, followed by septicæmia and death on the third day; and two or three other fatal cases. The advocates of the treatment forgot to include the relation of such cases in their published reports. If such cases came to the ears of one individual who made no inquiries how many similar cases were there which were never heard of?

He was far from saying that the occurrence of a fatal case necessarily condemned treatment for serious complaints, but he did say that those who so strongly recommended it were bound to tell the whole truth, and not to content themselves with casual remarks that it required care and should only be used in skilled hands. Such treatment of the subject could only discredit the method.

Dr. GALABIN thought it would be of importance if the experts in electricity could clear up one point in connection with the application of the current. It was often vaguely stated that electrolysis of the cells of the body predisposed them to absorption. Was there in point of fact any electrolysis of cells midway between the poles, or was there only electrolysis at the poles, producing a caustic action extending from the pole? We know that in the case of a homogeneous chemical electrolyte, although the intermediate molecules were constantly being broken up and united again during the passage of the current, there was no apparent electrolysis except at the poles, and the intervening substance remained entirely unaltered. This could not occur with a discontinuous and

more or less heterogeneous substance such as the cells of the body. If the cells formed the electrolyte they must be broken up and destroyed by the current, and the substances appearing at the poles must be those derived from the decomposition of albuminoid bodies, not merely soda, potash, or hydrochloric acid, oxygen or hydrogen. As there was no evidence of the occurrence of this, even with dead tissue, he thought that there was strong presumption, if not absolute proof, that the electrolyte was formed, not by the cells themselves, but by the saline fluid permeating them, and that there was no electrolysis of the cells at all. Of course some heat was produced between the poles, and there might be also muscular contraction, but the latter not so much as with an interrupted current. He thought that all the effects which had been found to result from the electric current might be accounted for by the caustic action to the interior of the uterus or to the point of puncture. In his own experience he had found that in cases of fibroid tumour in which the uterine canal was so long and tortuous that the electrode could be introduced only a small part of the whole length, even the hæmostatic action of the positive pole was not obtained, much less any notable diminution of the tumour.

Dr. Galabin did not think that experience was yet sufficient to warrant a positive conclusion as to the value of the electrical treatment. But he felt some disappointment that among the facts brought forward in the present papers there were none bearing upon the treatment of fibroid tumours, especially as Dr. Steavenson had had some experience in this direction. Even the speeches of Dr. Playfair and Dr. Parsons did not supply any evidence in what proportion of cases we might expect either cure of hæmorrhage through electricity or diminution of the tumours. Satisfactory results in cases of hæmorrhage were often obtained by other modes of intra-uterine treatment.

It would have been of more value if the results of the

whole of a series of consecutive cases had been recorded. Dr. Galabin had himself found relief to hæmorrhage from the use of the positive pole, but, in the majority of cases, no decided reduction of the tumour. Evidence of reduction would be more satisfactory if the tumours were large enough to allow definite external measurements to be given, as well as measurements by the sound. It was of significance that the only case of reduction of size mentioned by Dr. Playfair was one in which there had been evidence of sloughing of the growth, and grave symptoms to the patient.

Dr. Galabin thought that the use of electricity to produce a caustic effect on the interior of the uterus had obvious advantages from the facility with which it could be applied through a narrow cervix and without affecting the cervix. But if it simply amounted to the use of a solution of caustic soda or other chemical substance it was not so clear that it had the same advantage over the direct use of caustics of known strength in cases of erosion or cancer of the cervix, which could be easily reached.

Dr. Heywood Smith said he quite agreed with Dr. Playfair that it was the reverse of scientific to burk a discussion on any new therapeutical measure because of the prejudices of unreasoning opponents, and he endorsed what had fallen from Dr. Champneys as to the fruitlessness of the present discussion. The trial was still going on, and they were then examining witnesses, and the time had not yet arrived for pronouncing the verdict. The difficulty that beset all such investigations arose from the impossibility of running any two cases exactly similar on different treatments for comparison, but with regard to fibrous tumours their natural history should be carefully studied and observations made of those cases which seemed subject to a certain natural retrogression, and these typical cases should be selected, and careful records kept, of every change which could be ascribed to electrolysis.

With regard to what Dr. Parsons had said about deposits, the result of pelvic inflammation, he had no doubt but that when the stage of active inflammation had been passed electrolysis might be applied to such deposits with benefit. Trial should also be made of the effect of electrolysis on those cases of ovarian pain arising from chronic ovaritis and associated with so-called ovarian dysmenorrhœa, whether arising from increased vascularity of the organs or from cirrhosis, as such cases proved very intractable to the ordinary methods of treatment. What was wanted was a short and concise handbook dealing with the subject, and pointing out the lines for investigation, and the best methods of carrying it out.

The PRESIDENT said that he hoped the Fellows would not be led away by Dr. Playfair's rhetoric, but that they would weigh his facts and estimate them at their proper value. Dr. Playfair seemed to imply that those who did not accept the statements made as to the value of electricity in the treatment of the diseases of women objected to its being tried at all. He wished it to be placed on its trial, and was not aware that any objection had been made to this. It had been already tried for some time, and the literature on the subject was not inconsiderable, but it must be added that it was very disappointing. The literature of the Apostoli method consists in great part of descriptions of the instruments used, and of elaborate and detailed accounts of the mode of using them. Dr. Apostoli himself had described the instruments and their use again and again, but he had published little else, except a series of general assertions and sweeping statements. In estimating the value of the published work of an author who is not personally known to the reader, and whose powers of observation cannot be tested personally, the reader should be acquainted with more than one of such author's published writings; he should know his record, for one work may throw much light upon the value of another.

In 1881 Dr. Apostoli was engaged in the study of the value of electricity in labour, and a paper by him was published in the 'Transactions of the International Medical Congress' of that year, on electricity in labour. In this paper he proposed to treat the uterus during the lying-in period by faradization with a view to prevent subinvolution, metritis, and other evils. The Fellows of the Society would form each his own estimate of that proposal. Dr. Apostoli had since published a work on 'Chronic Metritis and its Treatment by Electricity.' This work consisted in part of a description of instruments and their application, and in part of a series of general and sweeping assertions, without a single case in support of them.

Dr. Steavenson's paper was not free from similar sweeping statements; for instance, Dr. Steavenson states that the contracted cervix can be dilated by electricity, and that the results are more permanent than those obtained by other means. Now, the fact is that we do not know how long the results obtained by tents, bougies, &c., last; there are no data in existence which make it possible to form any valid conclusion on this point. How then can Dr. Steavenson maintain his statement? Again, Dr. Steavenson states that electricity cures the stenosis of the cervical canal caused by amputation of the cervix by the galvano-cautery. What are the facts justifying this assertion? Dr. Carlet—a pupil of Dr. Apostoli—has published a work on the treatment of fibroid tumours by electricity after the method of his master. This book contains an account of the cases treated by Dr. Apostoli up to the year 1884. In this book is found the following statement: "It is certain that in practice small, interstitial, fibroid tumours, which require for their diagnosis great skill in digital examination and in the use of the sound, are often regarded as chronic metritis, engorgement of the ileum, ulceration of the neck, anteversion, anteflexion, and especially retroflexion and retroversion." This appears to be the idea dominating Dr. Apostoli's mode of diagnosis, for what do the cases recorded in Dr. Carlet's

works reveal? During the period mentioned, Dr. Apostoli treated ninety-four cases of what he calls fibroid tumours of the uterus. Fifty-nine of these were treated by positive galvano-caustic, twenty-one by negative, five by positive and negative, and nine by puncture.

On examining the fifty-nine cases it is found that the canal of the uterus measured 10 cm., that is 4 inches or more in four cases only. In two of these it measured 13½ and 14 cm. or about 5½ in. In all the rest it measured not more than 3½ in., and in more than half less than 3¼, and in twenty-five less than 3 in. Together with the slight elongation of the canal there was enlargement and induration of the uterus, and hæmorrhage. I am not ashamed of the ignorance which regards these cases, with two or three exceptions, as cases of subinvolution or chronic metritis. These cases were treated for hæmorrhage for periods varying from two or three months to a year; in none of them followed a diminution in the length of the canal greater than 1·5 cm., while in most it was not more than 1 cm. It is not to be doubted that such cases can be effectually treated in a far shorter time without the aid of electricity.

Of the twenty-one cases treated by negative galvano-caustic, in one only did the canal of the uterus measure 4 in., in the others it measured just over or just under 3 in. In none of them was there more evidence of the presence of a fibroid tumour than in the first class of cases, and the effect of the treatment in reducing the size of the uterus was practically *nil*, for in no case did the reduction amount to more than 1½ cm., or a little over half an inch.

Five cases were treated by puncture. These were mostly large fibroids, but in only one of them could Dr. Apostoli introduce the sound. The canal measured 15 cm. before, and 11½ cm. after, treatment. This shows a diminution of 3½ cm., or a little less than 1½ in., a decrease which is known to occur as a part of the cyclical changes of fibroids. There was a reduction in

the girth of the abdomen at the umbilicus, in one case of 6 cm. (2½ in.), in another of 16 cm. (6¼ in.).

Nine cases were treated by positive and negative galvano-caustic. In seven of these the uterus was somewhat large, and presented no evidence of fibroid tumour. In one the canal measured 21 cm. or 8¼ in.; it was reduced during the treatment to 12 or 14 cm. or about 5 in.; in another the canal measured 14 cm. and was reduced to 10½ cm. In none of these cases did any alteration in size take place which might not be presented by fibroids when not treated at all.

A demand is made to put this method of treatment to the test, but it must be admitted that it has been tried by its founder, and the results obtained by him do not show that the treatment is of value, for the few selected cases which have been brought forward to-night are insignificant compared with the number of Dr. Apostoli's cases already published. That there may be a place for the employment of electricity in the treatment of the diseases of women is not denied, but as yet no case has been made out for it.

Dr. STEAVENSON said that in the short time at his disposal he was afraid he should have some difficulty in answering all the questions asked and criticisms made upon his paper, but that he would try to answer them as far as possible *seriatim*. In some instances the same question had been repeated in different ways; he would therefore answer them together, and in some cases questions and mistakes had been answered and corrected by subsequent speakers. In the first place several of the apparent inaccuracies and shortcomings were due to the fact that the paper had been considerably delayed. It was written more than a year ago. The batteries and instruments intended to illustrate it were exhibited to the Society in July last. He had received the paper back from the secretaries for the purpose of making an abstract, but the abstract and paper were sent in before the meeting

of the British Medical Association last year in Dublin. This would account for the appearance of one of the remarks to which objection had been taken, viz. that the negative punctures in the treatment of uterine fibroids were made deeply with the object of reaching, if possible, the uterine cavity. This was taken from one of the early reports which were published concerning the practice adopted by Dr. Apostoli. In the paper read at Dublin the practice was somewhat modified, and Dr. Apostoli advocated slight punctures only to the depth of a quarter or one third of an inch. Another complaint had been made that galvanometric measurements were not given in the account of the cases reported by Dr. Drage. These cases were treated more than a year before the earliest notice of Dr. Apostoli's work had appeared in the medical journals, and before any galvanometers such as are now used with high readings were obtainable. When the application of electricity to medicine is making such rapid advances the delay of a paper for a whole year made a great difference. No doubt the delay was unavoidable, but it would explain many, of what would otherwise appear to be, mistakes or omissions.

Dr. Horrocks had complimented him upon the important admission that the electrolytic action of electricity was limited to its cauterizing properties. He (Dr. Steavenson) had made no such admission. It was to the cauterizing action of electrolysis that his paper chiefly referred. The object of his paper was to advocate a more extensive use of electrolysis in those affections and diseases of women in which caustics were most usually employed. He agreed with Dr. Horrocks that batteries were cumbersome and could not be easily carried from house to house; that they were frequently getting out of order; that a technical knowledge was required for their efficient use; that a large number of different electrodes and apparatus were required, and that therefore this form of treatment was not likely altogether to supplant the older forms of caustics and local applications usually

employed. But these objections having been overcome, and the application of electrolysis rendered possible, Dr. Steavenson maintained that it had numerous advantages over the present methods of treatment, and in doing so he had adopted a most happy phrase used by Dr. Horrocks himself in a discussion on the electrolytic treatment of strictures of the urethra which had taken place some months before at Greenwich, on a paper read before the West Kent Medico-Chirurgical Society. Dr. Horrocks then described electrolysis as "a more efficient and elegant way of applying caustic than any other that we possessed." This described the action of electrolysis so aptly that Dr. Steavenson had taken the words down and incorporated them in his paper. It could be, as it had been described by another speaker, applied directly to the point it is wished to affect; its action could be limited to that point, such as the os uteri. There was no chance of any of the caustic material, such as potassa fusa or nitric acid, trickling down and destroying part of the mucous surface of the vagina that was not intended. It was therefore so peculiarly applicable to parts difficult of access that had to be reached through more or less narrow mucous passages. Its action can be commenced and arrested at will, and immediately the current is cut off all caustic action ceases.

Dr. Bantock had objected to the term electrolysis being applied to this caustic action of electricity, and was surprised that he (Dr. Steavenson) continued to use it. Dr. Steavenson replied that it was electrolysis. The word electrolysis meant dissolution of chemical compounds by means of electricity, and that was what took place on the application of an electrode to animal tissue when a current was allowed to flow. The caustic which appeared at the positive and negative poles respectively was due to electrolysis, and it was electrolysis. This action had been described by Mr. Bryant, of Guy's, in his work on surgery as "electrolytic caustic," and it was a perfectly accurate description. It was known and admitted that

electrolysis did take place at the surface of the electrodes when an electric current was passed through animal tissue. The only point open to controversy was whether any electrolytic action took place in the substance of the tissue between the two poles, such as in the intervening mass of a fibroid tumour. This point required further investigation, but Dr. Steavenson believed that some slight electrolytic action did take place. He asserted that he believed it to be impossible to pass an electric current through animal tissue, composed as it was of compounds which, being at the same time conductors, were also capable of being acted upon by electricity, without producing some molecular change. All the elements composing animal tissue were electro-positive or electro-negative to each other, and their compounds also possessed these characteristics, and when the current passed from one form of tissue to another it was probable that some electrolytic change took place where their surfaces were in apposition. In the substance of a fibroid tumour there was no homogeneous material through which the simple interchange of molecules could take place in the passage of a current from one electrode to the other. If the circuit of a current of electricity was completed through heterogeneous compounds which were capable of being acted upon by electricity as well as being conductors, electrolysis took place at the different surfaces where these compounds met. Referring to the experiments made by Dr. Parsons, who, Dr. Steavenson said, appeared to have studied the subject in a more scientific manner than most of those who had entered into the discussion, three glass jars were filled with a solution of iodide of potassium, and joined by strands of moistened lamp-wick which acted as conductors; a current was passed and free iodine was discovered in the jar nearest the positive pole, and caustic potash in the jar nearest the negative pole; in the intervening jar no change had taken place. Dr. Steavenson had repeated the experiment, substituting pieces of copper wire for the

lamp-wick as his connecting media. The copper wire, while being a very good conductor, was also decomposed by electricity. In this case the iodide of potassium was split up in each jar, free iodine appearing at the positive ends of the pieces of connecting wire, and a large quantity of gas (hydrogen) being liberated at the negative ends.

The remarks and questions asked by Dr. Aust Lawrence Dr. Steavenson said he had replied to privately at the conclusion of the first meeting, as Dr. Lawrence had said he could not be present at the adjourned discussion. These questions chiefly related to points which could be explained by the long delay which had occurred between the reading of the paper and the time that it was written.

To Dr. Herman Dr. Steavenson replied that he was not responsible for the cases which were sent to him for electrolytic treatment at St. Bartholomew's Hospital, but all that were sent to him he considered very suitable for the purpose of finding out what advantages there were attached to this form of treatment, and that was the object with which they were sent. He thought that if all poor women suffering from erosion or abrasion of the os uteri and its consequent discomforts were refused treatment after two months, the number of patients applying at the gynæcological out-patient department would be very materially reduced; and if they were denied treatment at one hospital they would soon seek relief at some other, whether relief was possible or not. In the cases which had been referred to nearly every other form of treatment had been tried—caustic potash, nitric acid, chromic acid, nitrate of silver, and nearly every other caustic and escharotic that could be mentioned. The periods of treatment ranged from twelve months to two years or more; they could therefore be described as chronic cases and were good test cases for the purpose of seeing what electrolysis could do for them. Dr. Steavenson maintained that the results were very satisfactory, for although the electrolytic treatment extended in one or more of the cases over four months the erosions

healed in a more complete and satisfactory manner than they had appeared to do under all the other modes of treatment. What he claimed was that if local treatment was to be resorted to at all it could be more efficiently and successfully carried out by elerctolysis than by any other form of caustic. He agreed with Dr. Herman that caruncle of the urethra could be better treated by other means. He believed the best mode of treatment was to remove them by galvano-cautery, and cauterize the base from which they grew by the same process. As far as his experience went he believed that if removed by the knife or scissors without cauterization of the base they would return. He had assisted Dr. Gibbons in trying electrolysis in these cases, and he believed they were quite justified in making the experiment, for what they wanted to arrive at was what was the best mode of treatment.

Dr. Playfair had entered a strong protest against gynæcological cases requiring electrical treatment being handed over to those he was pleased to call electricians, as he understood was done at St. Bartholomew's. Dr. Steavenson said he would not enter largely upon that point as he wished to avoid as much as possible any personal allusions being introduced into the discussion. The cutler who made the instruments for an ovariotomy, to whom Dr. Playfair had likened the electricians, was not a qualified medical man. Dr. Steavenson said he had an advantage over the cutler as he had studied in the gynæcological wards of his hospital, and must say that he found no particular difficulty in passing a uterine sound. As Dr. Playfair was kind enough to make an exception in his favour, and allowed that he possessed sufficient gynæcological knowledge to be entrusted with the treatment of such cases, his objection therefore to the practice which obtained at St. Bartholomew's fell to the ground. Dr. Playfair had dwelt largely upon the technical difficulties connected with this electrolytic treatment. The difficulties were not purely gynæcological or he would not object to every gynæcologist adopting it, but he said

that some knowledge of batteries, and of the theory and action of electricity, was indispensable. Dr. Steavenson thought that in the main they were of the same opinion. Gynæcologists should not attempt this treatment without some knowledge of electricity, and so-called electricians should not be entrusted with the cases without some knowledge of gynæcology. As a matter of fact a consultant with a large practice could not possibly afford the time necessary for carrying out efficiently this form of treatment. If he advised it he would most likely also recommend the person by whom he wished it to be undertaken. The great necessity, as Dr. Playfair had stated, for a superior or profound knowledge of gynæcology was in the selection of the cases—the diagnosis of those cases in which electricity was likely to be beneficial. In that respect Dr. Steavenson said he was pre-eminently fortunate, for all his cases had been selected for him by those who stood highest in repute for profound gynæcological knowledge, and he was thankful that such was the case.

Dr. Galabin's remarks were chiefly replied to in what was said in answer to Dr. Horrocks.

In answer to the President, Dr. Steavenson said that perhaps it was premature to say that the enlargement of the cervical canal produced by electrolysis in the treatment of dysmenorrhœa was more permanent than when obtained by dilatation or incisions, but Dr. Williams admitted that with dilatation, when the canal had been stretched to a large size, some contraction occurred at once although the passage remained larger than before the operation. With electrolysis no pressure or stretching occurred at all; the passage was enlarged in the same way as electrolysis enlarged the calibre of the urethra when used for stricture. The passage remained immediately after the operation as large, or perhaps slightly larger, than it had been made by the electrolysis; there was no immediate contraction as after dilatation, and the enlargement remained the same a fortnight or a month or six weeks after the electrolysis. He had not had sufficient

experience nor had he adopted the treatment for a sufficiently lengthened period to say for how long this enlargement remained. With regard to the President's remark upon the action of electrolysis on cicatricial tissue in parts that could be observed, Dr. Steavenson said that he had seen it tried on keloid scar tissue on the neck, the result of the healing of strumous glands. The scar tissue was altered and softened, but the patient had ceased to attend the hospital. He had also seen it tried on cicatricial tissue which narrowed the meatus of the urethra. The action of electrolysis in enlarging the opening could be observed, and the melted down, shiny débris could be seen and felt. Dr. Steavenson had recently a case of stricture of the urethra with perineal and scrotal fistulæ surrounded by a large mass of hard brawny tissue. During the treatment by electrolysis the indurated thickening subsided. Often in the penile portion of the urethra, where the hard gristly thickening forming the stricture could be felt, its disappearance was readily noticeable both to the patient and the operator. These results were well in view, and Dr. Steavenson had no doubt that at least small collections of adventitious tissue were altered, and rendered capable of being reabsorbed under the influence of an electric current.

Dr. GIBBONS, in answer to Dr. Herman's remarks about the case of caruncle combined with lupus minimus, in which the caruncle was removed at the second sitting, explained that the caruncle was not touched at the first sitting because, as it was exquisitely painful and as what had already been done to the lupus minimus had given great pain, he deemed it advisable to defer dealing with the caruncle, as he could not at that moment conveniently have an anæsthetic administered. Moreover, the caruncle was removed by electrolytic action, and not in the ordinary way, otherwise it was obvious that there would have been no object in relating the case.

Although this case alone might not appear striking, it

must be borne in mind that these cases had been reported exactly as they came under observation; there had been no attempt at selection in any way, and he was indebted to Dr. Herman for saying that they had been placed before the Society in a candid manner. Dr. Herman considered that the results were not brilliant in these cases, and that practically they could have been cured by other means. Dr. Gibbons did not for a moment deny this, but the outcome of his own individual experience with reference to this method of treatment in these cases was that the results seemed more satisfactory, and that it cured more thoroughly than the various other means at our disposal. In answer to the question as to what became of these cases, he replied that in those which he had been able to follow up he found that they had remained cured; some of course he had not seen again, although he thought it probable that had it been necessary they would have returned for advice. But about this point he considered in dealing with all reports of patients there must always be a difficulty and a great amount of uncertainty.

He stated that he had been working at electrolysis continuously in hospital practice for upwards of two years, but that (except in the case of fibroids, which he had purposely not mentioned, regarding it quite as a separate subject) he had never used it in private practice. And this led him to say a word upon the excellent remarks of Dr. Horrocks, who very rightly drew attention to the difficulties in the way of this method of treatment —difficulties which only those who had worked with it could estimate. Dr. Gibbons really thought that this, to practical men, was the very pith of the whole subject. Although he had faithfully put before the Society a number of cases simply for what they were worth, he should be sorry to convey the impression that he considered this treatment as it was made use of at present at all perfect for the general run of practice. He frankly admitted that it was much too troublesome, and that the

instruments at our disposal were much too cumbersome—for the battery itself was an instrument—for it to be accepted generally as an ordinary method of treatment. It was easy to carry it on in a hospital where there were nurses and others to assist, but that was a very different matter from using it in private practice. Then again it occupied a considerable amount of time, which was a serious objection. Nevertheless, with all its present disadvantages, it was a means of treatment well worthy of a prolonged trial by those having patience and material at their disposal with which to test its efficacy. Dr. Gibbons confessed that he commenced treatment as a sceptic, and he did not hesitate to say now that he was satisfied with the results he had obtained. He had not intended to allude to the treatment of fibroids, because his paper did not refer to it, and he considered that it would have been much better dealt with by itself. Dr. Playfair and others, however, had mentioned it, and the former had adduced important clinical facts in favour of the use of electrolysis in these tumours when hæmorrhagic, and Dr. Gibbons agreed with Dr. Playfair that what we wanted were clinical facts. Only that day Dr. Gibbons had seen a patient whom he had treated for hæmorrhagic fibroid who had been blanched and compelled to rest for days every month in bed or on a couch, and who had undergone the usual round of treatment before coming to him. In her case electrolysis had completely cured her, and she now felt well and enjoyed life —at any rate for the present. More than this one could not say, and in reference to the remarks of Dr. Galabin and Dr. Champneys he felt that we required much more time before pronouncing a definite opinion on cases, so that we might know whether they were permanently cured. He therefore agreed with Dr. Champneys that until definite statements could be made—and this could only be done after the lapse of time—results had better not be hastily published. Regarding what Dr. Bantock had said, Dr. Gibbons believed that it was impossible to

have listened to his remarks without becoming convinced that his (Dr. Bantock's) mind was thoroughly prejudiced against electrolysis, and that to account for this he had advanced not his experience but theory. His desire to contrast oöphorectomy with electrolysis, and to dilate on the advantages of the former in producing a radical cure, showed clearly which he would prefer. But Dr. Gibbons maintained that the very object of electrolysis was to avoid the risks run by oöphorectomy or any other abdominal operation on uterine fibroids. His paper, however, comprised, not fibroids, but still a class of cases of the highest importance, and he contended that in dealing with cases of chronic metritis, endocervicitis, and the like, one should always bear in mind, in criticising treatment of any kind, that we were dealing with cases which, at the best, were eminently unsatisfactory to treat, and what he asked was that any suggestion of a new method of treatment should be listened to with attention, until at any rate it was proved by extended experience to be unworthy of support.

Dr. SHAW, in reply, said that a study of the sphygmogram which accompanied his paper would doubtless convince Dr. Parsons that an increase of arterial tension really took place, and that this increased tension continued for a longer period than the actual duration of the current. If a rise of arterial tension occurred in the radial pulse when an ordinary intra-uterine application was made, it was but reasonable to suppose that it took place even more energetically in vessels in closer relation to the electrical stimulus.

That electrolysis really took place was beyond doubt, because at the positive and negative poles, together with acids and alkaline bases respectively, there were acid and alkali albumens.

With respect to the cases of failure which had been reported, he ventured to suggest that they were owing to a too vigorous or too early use of the hæmostatic action

of the positive pole, which relieved the bleeding for the moment, but increased ovarian irritation, and thus really did harm. This would probably be avoided if a preliminary or occasional resort to the derivative action of the negative pole was carried into practice.

The negative pole acted, he thought, on a stricture or stenosed cervix in a twofold manner, firstly, by causing the swelling up of capillary granulations, and secondly, by actual solvent action on the fibrous tissues.

Experiments which were detailed in an appendix to the paper but were not read, for the sake of time, would satisfy Dr. Steavenson that electrolysis took place not only at the poles but also between them. In the case of a vessel consisting of five chambers separated by animal membrane, and each filled with the same quantity of a standard solution of iodide of potassium, not only was iodine recoverable from the chamber which held the positive pole to the extent of nearly double the quantity originally introduced, but free iodine was also present in the chamber next to the positive.

JULY 4TH, 1888.

JOHN WILLIAMS, M.D., President, in the Chair.

Present—27 Fellows and 1 Visitor.

Samuel Sloan, M.D. (Glasgow), was admitted a Fellow of the Society; and Edwin Tenison Collins, L.S.A., was declared admitted.

The following gentlemen were elected Fellows of the Society:—Charles Milton Fegen, M.R.C.S. (Bedford); John George Johnson, L.R.C.P.Lond. (Swindon); and William Japp Sinclair, M.D.Aber. (Manchester).

The following gentlemen were proposed for election:—Herbert Campbell Burton, L.R.C.P.Lond. (Blackheath), and William Duncan, L.R.C.P. & S.Ed. (Bristol).

CONGENITAL MALIGNANT DISEASE OF THE FOREHEAD AND NECK.

By JOHN PHILLIPS, M.D.

DR. JOHN PHILLIPS showed a newborn child with congenital malignant disease of the forehead and neck. No dystocia was caused owing to the size of the mother's pelvis. He reserved any further remarks on the case

until opportunity had been afforded for a post-mortem examination.

SECTIONS OF SOLID NON-MALIGNANT TUMOURS OF THE OVARY AND UTERUS.

By W. S. A. Griffith, M.D.

Report on Dr. Aust Lawrence's and Dr. Penrose's specimens of extra-uterine fœtation.

1. *Dr. Aust Lawrence's specimen.*—We have examined sections made by Dr. Penrose. The greater part of each section exhibited a structure displaying irregularly interlacing lines as seen in coagulating fibrin, which indeed we believed the structure to be, for we could trace every gradation between recently extravasated blood and a close network of fibrin invaded by leucocytes. Interspersed in this tissue were islands and bands more deeply stained. In these islands we found spaces, some ovoid, some elongated and bounded by very deeply stained tissue. The spaces wherein the structure was most distinct were filled with connective tissue of very young type with large round or oval nuclei, and indistinctly fibrillated. These spaces represented, in our opinion, placental villi. Similar structures, more evidently villi, projected from parts of the free margin of the section. The entire structure was, in all essential points, similar to a specimen of an extra-uterine placenta removed about three months after the death of the child, and shown at a meeting of the Society by Dr. Herman ('Transactions,' vol. xxviii, 1886, p. 141), who has submitted sections of that placenta to the Committee.

We therefore believe that the specimen exhibited by Dr. Aust Lawrence was the placenta altered by the

effusion of blood into its substance; the blood being imperfectly organised after effusion. In four sections of the undoubted placenta from Dr. Champneys' case of extra-uterine gestation ('Trans. Obst. Soc.,' vol. xxiv, 1887, p. 456) no villi could be found. This shows that their absence does not disprove placental tissue.

2. *Dr. Penrose's specimen.*—We have examined sections made by Dr. Penrose, through a portion of small intestine to which were attached little pieces of tissue supposed to be placental.

The intestinal villi, muscularis mucosæ, submucous tissue and true muscular coat were well defined. Towards the serous boundary of the intestine the normal characters were indistinct. Apparently recent inflammatory exudation formed a deposit of irregular depth under the serous coat. Under a high power this deposit appeared as connective tissue including abundant collections of leucocytes. Nothing resembling villi or the large vessels found in normal placental tissue could be detected. Owing to the difficulty in defining the peritoneal endothelium, it was not quite clear that the deposit might not be outside the endothelium, representing organised peritonitic effusion.

ALBAN DORAN.
G. E. HERMAN.
F. H. CHAMPNEYS.

THE CONDITIONS WHICH FAVOUR MERCURIALISM IN LYING-IN WOMEN, WITH SUGGESTIONS FOR ITS PREVENTION.

By Robert Boxall, M.D., M.R.C.P.,
PHYSICIAN TO THE GENERAL LYING-IN HOSPITAL.

(Received 9th July, 1887.)

(*Abstract.*)

The question is debated under two separate headings—(1) increased absorption, (2) defective elimination.

Under the first head—

The site of absorption is discussed; the question whether the solution obtains entrance to the cavity of the uterus when the uterine tube has not been employed is debated, and an experimental investigation undertaken with a view to determine the point is related.

It is suggested that absorption not infrequently occurs inside the uterus, even when the uterine tube has not been employed, but that it may also take place through the lacerated surfaces of the cervix, vagina, and perinæum, or even through the intact mucous membrane. Reference is made to the experimental research conducted by MM. Doléris and L. Butte which bears on this point.

With a view to diminish the risk of absorption it is suggested—

1. That not only should care be exercised to obtain contraction of the uterus, but that it should be also carefully maintained, and, above all, that the douche should always be given at such a temperature as will stimulate the uterus to action.

2. That the douche should invariably be administered in the supine position, the uterus at the same time being supervised by one hand placed on the abdomen.

3. That, when the administration is completed, the precaution

should invariably be taken of ascertaining that the uterus is contracted by palpating the abdomen, and, if distended, the fundus should be squeezed like a sponge in the palm of the hand, and at the same time should be depressed with the object of evacuating the vagina.

4. That the surface of lacerations about the external orifice should be brought together, and any abrasions which remain should be coated with some material impervious to the solution.

Under the second head—

The relative eliminative power of the different excretory organs is discussed, and especial attention is directed to the condition of the kidneys and intestine.

The following suggestions are offered:

1. That chronic nephritis, and probably also those changes which occur in the kidneys during pregnancy, may by diminished elimination produce an accumulation in the system.

2. That the intestine possesses an eliminating power equal to if not greater than the kidneys.

With a view to obviate the risks arising from defective elimination—

1. That, when the kidneys are affected, the sublimate douche should not be employed, or, if used, extreme caution should be exercised.

2. That a free watery flow from the kidneys should be promoted, and that especial care should be directed to this point in hot weather.

3. That the bowels should be evacuated daily, either by salines or by the administration of such agents as produce copious and loose stools.

A tabulated series of eleven cases which presented symptoms of slight mercurialism is appended. A fatal case of mercurialism is also narrated.

THIS contribution is offered as a postscript to Dr. Dakin's elaborate paper on Mercurialism in Lying-in Women undergoing Sublimate Irrigation, which was read before the Society in December, 1886.

Setting aside the strength of the solution, and the frequency of its repetition, the various conditions under which

mercurialism is likely to occur obviously fall under one of two heads:

(1) Increased absorption.

(2) Defective elimination.

With regard to absorption, the question arises—Through what portion of the parturient tract may the mercury obtain an entrance into the general system? Is it necessary that the solution should find admission to the uterine cavity? What part may lacerations of the cervix, vagina, and perinæum play in the process? May absorption take place through the intact vaginal mucous membrane?

And, with regard to elimination—What share may each of the four organs, renal, alimentary, cutaneous and pulmonary, take in freeing the system from mercury which has become absorbed?

To several of these questions a partial answer has already been afforded. Corrosive sublimate is undoubtedly such an excellent antiseptic, and its employment in midwifery is so deservedly in the ascendant, that an endeavour to minimise its greatest drawback, the risk of mercurialism, must form a plea for reviewing the matter on the lines which I have already indicated.

When the subject was last before the Society, I mentioned that several slight cases of mercurialism were observed at the General Lying-in Hospital in the latter part of last year. These are now presented in a tabular form.

Summary of Cases.

Among 200 patients undergoing sublimate irrigation, eleven cases of mercurialism occurred.

In each case the vagina was douched (three quarts) immediately after labour and (three pints) night and morning during the puerperium, until the lochia ceased. In addition, in Case IX an intra-uterine douche was employed on the fourth day.

Five cases occurred in patients admitted during the last eight days of August.

Five of the patients were primiparæ; in four of these the fourchette was torn but there was no deep laceration, and in two a considerable laceration of the cervix occurred. In none of the multiparæ was any laceration of the external parts noted.

In two cases only was anæmia marked, but in three others its presence is also noted.

In three cases involution of the uterus was retarded, and in one of these constipation was also present.

In another an erosion existed on the cervix, and albumen was found in the urine in considerable quantity.

In five others constipation was a prominent feature.

In another a considerable amount of albumen was noticed in the urine.

In all the cases the symptoms were slight and evanescent, setting in usually from the sixth to the ninth day, and rapidly subsiding after the mercurial douche was discontinued.

In five cases diarrhœa occurred. In one of these the stools were tinged with blood, and tenesmus was present; in two others abdominal pain existed.

In five cases the bowels remained constipated throughout.

In two cases only were the bowels regular, and in one of these slight diarrhœa had previously occurred.

In ten cases the gums were affected, but no definite red line was present. In the remaining case the mouth generally felt sore.

In three cases loosening of the teeth was observed.

The tongue, with one exception, remained clean throughout.

Salivation, vomiting, and anorexia were absent.

The temperature in eight cases was absolutely normal throughout, and in the remaining three a mere transitory rise occurred, in each case reaching 100·2° and attributed

severally to constipation, to intestinal irritation, and to a distended state of the breasts.

Such is a brief summary of the cases.

Now, in the first place, it is evident that without intra-uterine irrigation mercurialism may occur. The question, however, arises, whether, when a vaginal douche is given, the solution may not find its way into the uterine cavity, and there become absorbed. That it might do so, especially when the uterus is in a relaxed condition, I felt assured by observing an actual distension of the uterus after a vaginal douche had been given on the second day after delivery. On compressing the organ, nearly a pint of retained fluid was expelled. But even immediately after delivery, when the organ is in a more firmly contracted state than is maintained for the first day or two, it is possible to prove experimentally that the solution may in some cases find an entrance into the uterine cavity. The following investigation, conducted at my request by Dr. Holloway at the General Lying-in Hospital, was undertaken in order to prove this point. Immediately after the expulsion of the placenta, a small, bright, copper coin, with thread attached, was passed well into the uterine cavity, no sublimate irrigation having been previously practised. The vaginal douche was then given in the usual way. Subsequently a Ferguson's speculum was passed, the vaginal portion of the cervix washed with pure water to prevent accidental contamination, and, the thread being pulled upon, the coin was brought down into the lower part of the uterus, then seized with forceps and removed. This procedure was adopted in ten cases. In two of these a deposit of mercury was found upon the surface of the coin, proving conclusively the presence of sublimate in the cavity of the uterus.

On the other hand, it by no means necessarily follows that in every case in which the solution obtains an entrance to the uterine cavity mercurialism occurs, for intra-uterine irrigation is frequently adopted without the supervention of hydrargyrismus. Does, then, contact of

the solution with the inner surface of the uterus tend to increase the risks of mercurialism? In the denuded condition of the mucosa after delivery decided *prima facie* grounds may be found for answering this question affirmatively. And, indeed, the comparative frequency with which mercurialism has followed intra-uterine irrigation confirms this. The fact that the patient more often escapes the risk of mercurialism must, as I shall presently show, be set down to the activity of the eliminative organs. This, however, does not detract from the practical bearing of the question. The possibility that in cases in which the vagina alone is irrigated, any considerable portion may enter, and be retained within the uterus should always be borne in mind.

I now pass to absorption by the lower portion of the parturient passage. Attention has already been directed to "ballooning" of the vagina and to the part which lacerations about the vulva may play on the one hand in offering a suitable surface for absorption, and on the other in allowing the escape of any fluid which may be retained. The foregoing cases tend to confirm the opinion that lacerations are by no means necessary to absorption. A possibility exists that the erosion in Case I may have proved an active site for absorption. That the mucous membrane of the vagina is in itself capable of absorbing sufficient to prove injurious is, I think, well shown by a case which occurred in October, 1884, at the General Lying-in Hospital. I am indebted to Dr. Champneys, under whose care the patient was admitted, for the notes of the case. It was determined to induce labour about the thirty-fourth week of gestation on account of contraction at the pelvic brim. A gum elastic bougie was inserted to the fundus. No bleeding followed the operation. The vagina was douched three times a day with 1 in 2000 solution. After three days the gums became tender and the teeth loose; diarrhœa followed. Boric acid solution was substituted for sublimate. Labour came on next day and the mercurial symptoms almost immedi-

ately disappeared. The readiness with which mercury may find an entrance into the system through the medium of healthy skin, when inunction is practised, in itself renders absorption by the intact mucous membrane far from improbable.

In attempting to answer the first question then, I would suggest that absorption not infrequently occurs inside the uterus, even when the uterine tube has not been employed, but that it may also take place through the lacerated surface of the cervix, vagina, and perinæum, or even through the intact mucous membrane.

Before leaving this part of the subject, however, I must refer to an important experimental research on sublimate poisoning conducted by MM. Doléris and L. Butte (reported in the 'Nouvelles Archives d'Obstétrique et de Gynécologie,' vol. i, p. 739). In the first and second experiment the healthy vaginal mucous membrane of a bitch was irrigated with 1 in 1000 sublimate solution. The result of these experiments, as given by the authors, is as follows:—"It is evident that sublimate injections made on healthy mucous membranes are never followed by severe accidents, and that, if slight diarrhœa now and then occurs after the first douche, that symptom rapidly subsides, and is no longer capable of being reproduced by subsequent irrigations, even when they are repeated for more than eight days, and though the quantity of the solution be increased. But the case is altered when, in place of intact mucous membrane, a wound is irrigated, and we shall then see that in such a case the absorption of mercury often occurs in sufficient quantity to bring about a fatal result."

In the remaining eight experiments artificial wounds were made. The animals operated upon were rodents and dogs. The solution employed was similar to the above. The following is the result:—"When the wounds produced are of slight extent, and the irrigation limited in amount and duration, as a rule, changes of little importance only are observed; there is sometimes slight diarrhœa,

but more often nothing abnormal is presented. It is necessary, in order to bring about a fatal result, to have wounds of large extent and excavated, which allow the liquid to stagnate, or an irrigation of considerable duration. It is by acting on large wounds of the mucous membranes or of the skin that we have been able to cause absorption in our animals of a sufficient quantity of sublimate to bring about a fatal result."

From the result of these experiments these authors are enabled to draw the following conclusions:

"(1) The practice which consists in irrigating with sublimate the healthy mucous membranes does not appear to be attended with danger, and with the exception of certain trifling changes produced just after the first injection it may be considered all but innocuous.

"(2) Sublimate used in the irrigation of large wounds produces sanguineous diarrhœa with tenesmus, vomiting, albuminuria, progressive weakness, and frequently death, sometimes preceded by a considerable depression of temperature.

"(3) The anatomical lesions found at the autopsy are situated chiefly in the large intestine and kidneys. The large intestine is hyperæmic, presents submucous hæmorrhages, and sometimes sloughing of the mucous membrane. (These changes are identical with those pointed out by Prévost and more recently by Charrin and Roger.) The kidneys are the seat of an acute parenchymatous nephritis, and the straight tubules of the cortical substance are packed, at any rate in rodents, with an abundant calcareous deposit (Prévost's experiments).

"(4) The excess of urea in the blood, a sign of renal incompetence, shows that to the kidney affection must be attributed the greater share in the production of a fatal termination, when it follows some days after the irrigation."

Now, if the difference in the result of absorption on the one hand by healthy mucous membrane, and on the other by large wounds be established, the practice of

employing sublimate irrigation when deep wounds and extensive lacerations of the cervix and vagina exist, as pointed out by the above-mentioned observers, should be discontinued. It seems to me, however, that apart from such lesions, as a large wound is presented by the inner surface of the uterus, and particularly by the placental site after delivery, equally cogent reasons exist for its omission in the possibility of the solution obtaining an entrance to the uterine cavity, and that under such circumstances an intra-uterine douche should never be administered. On the other hand, experience shows that, provided the solution be accurately measured, and its administration carefully performed, these risks in either case may be minimised. With a view to diminish the dangers of absorption I would suggest:

(1) That not only should care be exercised to obtain contraction of the uterus, but that contraction should be also carefully maintained, and, above all, that the douche should always be given at such a temperature as will stimulate the uterus to action.

(2) That the douche should invariably be administered in the supine position, the uterus at the same time being supervised by one hand placed on the abdomen.

(3) That, when the administration is completed, the precaution should invariably be taken of ascertaining that the uterus is contracted by palpating the abdomen, and that, if distended, the fundus should be squeezed like a sponge in the palm of the hand, and at the same time should be depressed, with the object of evacuating the vagina.

(4) That the surface of lacerations about the external orifice should be brought together, and any abrasions which remain should be coated with some material impervious to the solution.

Despite every effort to the contrary, a certain proportion of the mercury appears to be invariably absorbed. The observations made by Keller on the urine support such a conclusion. Dr. Dakin's later observations confirm them, for he says, "I have found mercury in all

cases in which douches (sublimate) have been used, even for one day only." Dr. Braum has detected the presence of a considerable quantity of mercury in the fæces. Thus it is evident that, though it may be diminished in extent, absorption cannot be prevented. The obvious indication is to procure the speedy elimination of mercury from the system. That this eliminative power is, under favourable conditions, capable of rapidly removing all appreciable traces of mercury from the body, is borne out by the fact that, even in severe cases of poisoning, the poison cannot always be detected in the tissues within a few days after its presence has been established by unmistakable symptomatic evidence of mercurialism. It seems probable that in these conditions an explanation of idiosyncrasy may be found, and that anæmia, on which stress has also been laid, is but a symptom of the same underlying conditions.

I know of no observations which have been made with regard to the pulmonary and cutaneous organs as eliminators of mercury. It is reasonable to conclude, however, that the former can play but an infinitesimal part and the latter a *rôle* which sinks into insignificance when compared with that of the kidneys and intestine. It is to these organs that I would now direct especial attention.

In nearly every case of fatal mercurialism in which the kidneys were examined, a damaged condition of these organs has been observed. This, though in part due to recent inflammatory changes, which might be attributed to irritation of the drug, in many cases was evidently of long standing. The urine when examined presented characters in accordance with the renal affection. Mercury circulating in the system, finding the kidneys in a more or less damaged condition (and in association with pregnancy this is by no means unusual), is not only less readily eliminated than by healthy organs, but exerts in them an acute inflammatory change which still farther decreases their eliminative power.

Apart, however, from organic change in the kidneys, there is reason to believe that mere diminution in the secretion may exert an appreciable influence. Five of the above-mentioned cases occurred in patients admitted at the end of August. The meteorological chart shows that the highest temperature recorded during the year occurred at this period. Two other cases appeared in July, also during the prevalence of exceptionally hot weather. Others have also noted the same fact. The excessive heat promoting free diaphoresis at the expense of diuresis, it seems probable that less mercury is washed out by the kidneys, and that this diminished source of elimination, failing to be compensated by increased elimination through the skin, an accumulation takes place and makes its presence manifest by symptoms of mercurialism. Under these circumstances the obvious indication is to maintain free diuresis by a copious supply of liquids; lemonade made with fresh lemons is especially suitable. Saline diuretics and various natural mineral waters may be also recommended.

It seems to me, however, that it is of far greater importance to maintain free action of the bowels, and that too little attention has hitherto been paid to their eliminative action. In many of the cases above related constipation was a prominent feature up till the time at which the mercurial symptoms supervened.

With a view to maintain free and loose evacuations, and at the same time to stimulate the kidneys to action, I have for some time adopted the practice of giving salines in small doses from the time of delivery in all cases in which sublimate irrigation is practised. The prescription in general use is as follows: Sulphate of magnesia ʒj, carbonate of soda gr. xx, infusion of gentian ℥j, given three times a day. By this means a free evacuation of the bowels is usually insured on the third day (occasionally on the second). Sometimes, however, an increase in the first ingredient is required or a special purge necessitated. Contrary to the generally accepted view, no

diminution is found to occur in the secretion of milk; the supply, on the other hand, continues with the greatest regularity under the treatment adopted. Moreover, the comparative results on the puerperium (as judged by the pyrexia chart) is decidedly in favour of this treatment. The saline proves no detriment to the well-being of the infant.

Dr. L. Butte, writing on the subject of Mercurialism in the 'Nouvelles Archives d'Obstétrique et de Gynécologie' (vol. i, 1886, p. 181), points out that, as it is impossible to neutralise the poison by the aid of any chemical substance introduced into the stomach, when mercury has once been absorbed, every effort should be directed towards elimination of the poison. On this principle he advocates increase of blood pressure in order to augment the secretion of urine, and suggests that diuretics and digitalis should be given, and a large quantity of water taken, and pertinently remarks that the diarrhœa should be held in check rather than stopped, for, says he, "It is the intestine which is the principal channel for the elimination of mercury."

With this I entirely agree, but I would go a step further and apply the same principle of treatment, not only after the symptoms of mercurialism have become apparent, and damage has been already accomplished, but also before the poison has exerted any injurious influence on the tissues, and thus, if possible, prevent the injurious effects of absorption. If this be done the risks of mercurialism may be minimised.

In conclusion, I quote the following case which occurred in the Maternity of University College Hospital, and was unfortunately attended by a fatal result. I append short notes of the autopsy, at which I happened to be present.

A young and healthy primipara was delivered without assistance, and the placenta was already expelled before the attendant arrived. A vaginal douche of sublimate (1 in 2000) was given, and the patient is said to have experienced pain in the abdomen during its administra-

tion. On the afternoon of the same day, a deep laceration of the perinæum extending through the sphincter ani, which had previously escaped notice, was sutured, and a vaginal sublimate douche (1 in 1000) given. A vaginal douche of sublimate (1 in 2000) was given on each of the next three days. The tube was not inserted into the uterus. The bowels, which had been confined for some days previous to delivery, were afterwards kept so by Tinct. Opii ɱxxv—xxx daily. No purge was given on the third day. Thus the bowels had not been evacuated for a week before the symptoms of mercurialism began. Diarrhœa with offensive stools containing blood and mucus and associated with tenesmus and abdominal pain set in on the evening of the third day and continued till death. All food was refused. On the fourth day the morning temperature was 95°, and the evening 97·8°. The pulse, in the morning 120, and in the evening 160, was small and thready. The extremities became cold, and the lips a little blue. The patient sank into a semi-comatose condition. On the fifth day the sublimate douche was discontinued, and both uterus and vagina were irrigated with carbolic solution. The patient became collapsed and died on the following day. No salivation or affection of the gums was observed. The urine was not examined. At the autopsy it was found that the laceration had failed to unite. It was noted that the uterus was a little large for the period of the puerperium, but, with the exception of small portions of blood-clot and rather more ragged tissue than usual over the placental site, presents nothing abnormal. No signs of ante-mortem decomposition were present. The cellular tissue of the pelvis is quite healthy. Tubes healthy. No purulent collections. Slight general peritonitis. A patch about the size of a shilling on the transverse colon was almost sloughing, but no actual perforation had occurred. The inner surface of the large intestine throughout its entire length was dotted with hæmorrhages about the size of millet seeds, and some of these spots had broken down, forming minute ulcers.

Over the site of the patch mentioned above several large ulcers had coalesced. Several others about the size of a threepenny piece were found singly. In the upper part of the rectum was also a coalesced patch, about three inches long, and irregular in outline, coated with lymph. Some of the mucous folds of the colon were deeply injected, giving rise in parts to a coarse, transversely striated appearance. A similar change was found spreading through the ileo-cæcal valve into the small intestine for a distance of about nine inches. Stomach and rest of small intestine healthy. Liver normal. Both kidneys fatty and mottled, but no marked cirrhotic change. Capsule stripped off readily. Vasa recta were more pronounced than usual. No hæmorrhages present except those already described in inner coat of large, and lower end of small intestine. Brain not examined.

In the above case, whatever view be taken of the condition of the kidneys, the persistent constipation may justly be regarded as favouring the accumulation of mercury in the system.

It is worthy of remark that in this case, as has often happened before, the symptoms of mercurialism were inaccurately (as was afterwards proved) ascribed to septicæmia, and the sublimate douche was for a time persistently used, doubtless with the effect of aggravating the mischief. Dr. L. Butte has taken great pains to dissociate the symptoms. In conjunction with M. Doléris he points out that:

(1) Though in sublimate poisoning elevation of temperature may be produced as the result of severe intestinal lesions (gangrene, ulceration), and therefore of grave import, in less severe cases a subnormal temperature may be encountered, which, especially when the decline is progressive, is far more suggestive of commencing mercurialism. Elevation of temperature may also be indicative of septicæmia, which, it is pointed out, may coexist even with fatal mercurialism.

(2) Persistent albuminuria and the reduction of Fehling's

solution by the urine are valuable signs of the absorption of sublimate.

(3) A comparative analysis of the blood may furnish an idea of the renal incompetence and the accumulation of urea in the blood, a grave sign, indicating an amount of destruction in the kidney which is often irreparable.

With reference to these points it may be observed that in the fatal case above recorded, the temperature on the only occasion on which it was taken was found to be subnormal. In the eleven cases of slight mercurialism no subnormal temperatures occurred, but in one case a slight rise was attributed to the intestinal affection.

In five of the same cases Fehling's solution was not reduced when the urine was examined (Cases II, III, IV, VI, and VII). In all the others the urine reduced the solution. (In Case I very little on the third day, three times, three times, and twice its volume on the fourth, fifth, and sixth days respectively, an equal volume on the seventh, half its volume on the eighth, but none on the tenth. In Case V the urine reduced three times its volume of Fehling on the third and half its volume on the fourth day. In Case VIII none on the third but an equal volume on the fourth day. In Case IX none on the second but an equal volume on the third, and a little on the fourth day. In Case XI very little on the second and third days.) Considering, however, the frequency with which the urine of women recently delivered is found to reduce Fehling's solution but little importance can be attached to this point in the above cases.

The observation with regard to the excess of urea in the blood is of much importance, and I regret that I have no observations on this subject to offer with regard to the same cases. The fatal result in many of the cases which have been recorded was ushered in by symptoms not unlike those of uræmia.

The following suggestions are offered:

(1) That chronic nephritis, and probably also those changes which occur in the kidneys during pregnancy,

may, by diminished elimination, produce an accumulation in the system.

(2) That the intestine possesses an equal, if not a greater eliminating power than the kidneys.

With a view to obviate the risks arising from defective elimination—

(1) That when the kidneys are affected the sublimate douche should not be employed, or, if used, extreme caution should be exercised.

(2) That a free watery flow should be promoted by the kidneys, and that especial care should be directed to this point in hot weather.

(3) That the bowels should be evacuated daily either by salines, or by the administration of such agents as produce copious and loose stools.

An extended acquaintance with the use of sublimate solution in obstetric practice under the conditions and with the restrictions above indicated leads me to offer the following general conclusion—

That, when the patient is under constant observation, so that at the first indication of mercurialism its employment may be discontinued, sublimate irrigation may be practised without danger; but, failing this, its constant employment occasionally produces disastrous results, and cannot be recommended for all cases.

Cases of Mercurialism occurring at General Lying-in Hospital,

The figures i, ii, iii, &c., refer

No.	Reference.	Date of admission.	Para.	Character of labour.	Laceration.		Sublimate douche discontinued.	Anæmia.	Albuminuria.
					External parts.	Cervix in 1-para.			
I	191	July 8th, 1886	3	Natural	None	—	vi	—	iii $\frac{1}{17}$, xi, xii, xiii, xiv none, xvi $\frac{1}{2}$, xvii none
II	197	July 13th, 1886	1	Natural	Fourchette	"Mere indentations"	vi	Some	ii $\frac{1}{4}$, iii trace
III	238	Aug. 23rd, 1886	2	Natural	None	—	vi	Some	ii none
IV	241	Aug. 24th, 1886	1	Tedious	Fourchette	Not fissured	vii	—	*Labour* trace, i none
V	242	Aug. 25th, 1886	3	Natural	None	—	ix	Marked	iii, vi none
VI	251	Aug. 31st, 1886	1	Natural	None	Considerable	viii	—	iv none
VII	252	Aug. 31st, 1886	4	Natural	None	—	viii	—	iii none
VIII	277	Sept. 20th, 1886	3	Tedious	None	—	ix	Slight	iii, iv none
IX	293	Oct. 10th, 1886	1	Natural	Fourchette	Considerable	vii	—	iii trace
X	314	Nov. 1st, 1886	1	Natural	Fourchette	"Almost virgin"	xi	—	ii, iii, iv none
XI	340	Nov. 21st, 1886	2	Natural	None	—	iii	Considerable	ii, iii none

NOTE.—All patients douched with Condy
" " " Sublimate
" " " "
" " " "
" " " Condy on

from July 1st to Dec. 31st, 1886, among 200 patients admitted.

to the day of the puerperium.

Purge given iii.	State of bowels.	Mouth and gums.	Teeth.	Tongue.	Temperature.	Remarks.
Aperient Saline	Diarrhœa v—vii, with abdominal pain	Slightly spongy gums vi	—	Clean	Normal throughout	"Erosion on cervix, size of halfpenny, coated with brown mucus," xiv.
Ol. Ric.	Diarrhœa vi, with some abdominal pain	Slightly spongy gums vi	—	Clean	Normal throughout	
Ol. Ric.	Slight diarrhœa v—vii	Sore mouth and gums vi, bled ix	—	Clean	Normal throughout	"Uterus not well involuted," xiv.
Ol. Ric.	Considerable constipation throughout. Aperient Saline v acted slightly	Slightly sore and spongy gums vii, viii	Teeth loose vii	Clean	Normal throughout	Involution retarded.
Ol. Ric.	Marked constipation	Mouth sore ix, x	Teeth loose ix, x	Clean	100·2° vii from constipation	Severe constipation.
Ol. Ric.	Marked constipation	Gums sore viii, ix	—	Clean	Normal throughout	Marked constipation.
Pil. Rhei	Regular	Gums sore viii, ix	—	—	Normal throughout	
Ol. Ric.	Constipation. Pil. Rhei v, vii, xii	Gums sore ix—xi	Teeth loose ix—xi	Clean	Normal throughout	Chronic constipation.
(Mag. Sulph. ʒj 3 times a day throughout)	Slight diarrhœa v, at other times regular	Gums slightly sore vii—ix	—	Furred	100·2° v, intestinal irritation	Retained chorion, removed iv, intra-uterine sublimate douche given. Subinvolution.
Ol. Ric. in addition to Mag. Sulph. ʒj as above	Constipation at first. Aperient Saline v, Pil. Rhei viii. Slight diarrhœa and tenesmus. Stools contain mucus and blood xii	Gums sore and spongy xi—xiv	—	Clean	100·2° iii, from distended state of breasts	Considerable constipation.
Ol. Ric. in addition to Mag. Sulph. ʒj as above	Constipation, with some abdominal pain ii—vi	Gums slightly red iii	—	Clean	Normal throughout	Constipation.

before delivery.
(1 in 1000) immediately after labour, at 115° F.
(1 in 2000) for first three days of puerperium, at 110° F.
(1 in 4000) after third day ,, ,,
appearance of symptoms of mercurialism.

Dr. Matthews Duncan called attention to the easy distension of the puerperal uterus even long after delivery by injections. Many observations had been made on this subject, and a French author had made and published a valuable series of experiments. The distension shortly after delivery, as in post-partum hæmorrhage, was well known. He also thought Dr. Boxall had omitted a mode of conveyance, otherwise than by absorption, into the circulation. This was easily understood after delivery, when there were open sinuses at the placental site, but it might take place in the unimpregnated uterus, as he had shown in a case of injection of solution of perchloride of iron. The sudden deaths on injection of this agent were explainable only in this way. The fluid entered in bulk, not by absorption. Several such cases were published in the 'Transactions' of this Society.

Dr. Routh thought Dr. Boxall's paper was admirable, but he would venture to make some criticisms on it. At the outset he believed that this routine plan of always using corrosive sublimate injections was carried too far. First, he remarked that in all Dr. Boxall's cases but Case XI (where it was really questionable whether the slight redness of the gums was due to the mercury at all on the third day), the mercurial symptoms came on on the sixth, the ninth, or eleventh day, proving, he thought, that it was due to the prolonged continuance of the mercury. Secondly, he also noticed that the strength of the solution was 1 per 1000 on the first day, 1 in 2000 on the first three days, and 1 in 4000 after the third day. Now, he believed this very dilution was the cause of the evil. A weak solution would be rapidly absorbed, a stronger one would coagulate the albumen, stop the mouths of the absorbing vessels, and so prevent the entrance of septic substances from without, as well as destroy them. In proof of this he stated that the cases in which he had found nephritis and albuminuria result from this absorption were precisely those in which the solutions were weak. The stronger were not absorbed, but acted locally only. In proof he cited a case of a lady who in consequence of pendulous abdomen had gone one month beyond the usual time of gestation, in whom septicæmic symptoms occurred at the end of every week for four weeks consecutively. Pulse 130—140; temperature 105° to 107°, and sickness, violent pain, &c. These alarming symptoms were always removed in a day or two by iodine injections, but as they had recurred so frequently, at the end of the fifth week he used a corrosive sublimate injection, gr. j in ʒij. He noticed a considerable quantity of albuminous flakes come away which had not come away with the iodine. From that time the patient made a perfect recovery. Thirdly, he thought that for ordinary purposes tincture of iodine, thirty drops to half a pint of warm water, was the safest injection. This

he used generally for the vagina, especially if the lochia were not quite sweet, using it as hot as the patient could bear it whenever there was any smell, believing the hot water itself, even alone, coagulated the albumen also, and destroyed germs. He did not think it was necessary to inject the uterus unless there were feverish symptoms which led one to fear an impending attack of septic poisoning. If so it ought to be made with a strong solution of the perchloride, at least 1 in 960, if mercury was used at all. Fourth and lastly, he thought one advantage iodine had over mercury was its volatility. Injected into the uterus or vagina, its action was not restricted to the parts it touched. The fumes and vapour penetrated all round, which mercury could not do. He instanced one case which Dr. Grigg had mentioned in another Society, where septic symptoms occurred, and in it a mercurial injection was used. The patient died. A post-mortem examination revealed that the mercury had only extended about two thirds up the cavity of the uterus. This was white and sweet. The portion above was in a gangrenous condition. Now, had iodine been used, and with hot water, even if the injection had not penetrated high up, the fumes would, and the probability was the aseptic effect would have reached every affected part. These considerations, he thought, were objections to the routine practice of mercurial injections when iodine, Condy, or other antiseptics might be more safely used.

Dr. Samuel Sloan (Glasgow) would go farther than Dr. Routh, and would advise, as the best way to prevent mercurialism, the omission of vaginal injections in natural cases as a routine practice. He had been as enthusiastic as any man in his antiseptic midwifery, and looked at one time on routine injections as absolutely necessary. He had, however, for some years in hospital practice, and for a longer period in private practice, found that he had got better results without these routine injections. He could not say whether this was because these injections involved too much meddling with natural processes, or owing to the difficulty of keeping tubes, &c., absolutely clean. The operation had always been done by skilful hands. If any cause for suspecting septicæmia or sapræmia arose he then used mercurial injections, but in private practice this was an extremely rare event. In such cases, however, mercurialism was most unlikely to occur, because the need for the drug would diminish its activity. He would not advise that antiseptics should be given up in hospital practice; but he objected to the routine use of injections even there. He had to a large extent given up antiseptics in private midwifery practice; his belief being that, by absolute cleanliness, by healthy surroundings, by the careful management of the case during pregnancy, during labour and during the puerperium, women ought to be kept aseptic; their resisting power being at its maximum, and

the tendency to decomposition at the minimum. The lochia, we must remember, did not naturally decompose. When mercurial injections were skilfully given ballooning of the uterus could not take place. He had this prevented by ordering the organ to be firmly grasped by the hand during the injecting, and by pressing back the perineum whilst the woman coughed; retention in the vagina was avoided, especially if the patient were placed in the semi-supine position.

Dr. CHAMPNEYS said that he, for one, could not allow the remarks of the last speaker to pass unchallenged. He thought that the days were past in which a speaker who talked about "antiseptics in midwifery not being very necessary" would find supporters in that Society. Nothing was ever more absolutely proved than that to the use of antiseptics must be attributed the reduction of the mortality in child-birth, which was the most gratifying result of treatment in, perhaps, all medicine and surgery. On this subject, which had been repeatedly discussed in the Society, mostly or almost entirely as the outcome of work done at the General Lying-in Hospital, he would not dilate; there was no longer any real doubt as to principles, and but slight doubt as to details. There could be no doubt that antiseptic cleanliness of hands and instruments was the sheet-anchor of midwifery practice, and that the man who kept his hands soaked in corrosive sublimate did more good and prevented more harm than the most accomplished accoucheur who did not believe in antiseptics. As to routine injections there was some difference of opinion, but, before discussing this, he could not help referring again to the previous speaker's insinuation that Dr. Boxall's cases had not been carefully treated. What results he was able to show from the Glasgow Maternity he knew not, but he was not, perhaps, aware that sepsis had for some years been entirely abolished at the hospital mentioned. In his own practice in Glasgow he did not appear to have been so successful, but he (Dr. Champneys) did think it strange that the person to accuse Dr. Boxall of want of care should be a gentleman who attributed his own results to "dirty enemas." As to the use of routine vaginal douches they were, doubtless (in private at least), not absolutely necessary, and were never to be mentioned in the same breath with antiseptic cleanliness of the hands; yet, whereas the last speaker had given them up (perhaps for reasons given) for years and years, he (Dr. Champneys) had used them for years and years, and the longer he used them the more satisfied he was with them. What they did was to wash away the lochia, which (in the artificial though preferable recumbent position) collected in the vagina; they kept the patient clean, they refreshed her, and the heat stimulated the uterus to contract. In his experience patients who once had them used almost in-

variably requested their use henceforward as a great comfort. The material used was open to debate. In ordinary cases he did not use sublimate on account of the risk of mercurialism, and he thought (were he still actively engaged at the General Lying-in Hospital) he should not use it there unless specially indicated, for the antiseptic system was now so thoroughly ingrained in the midwives and nurses there that he thought a milder antiseptic, such as iodine, would suffice, and it would be free from the risks of poisoning. That, however, was a matter for the present acting physicians there to consider. The last speaker had spoken of the semi-prone position as being suitable for vaginal injections. He really could not picture the details of such a performance. How the bed was kept dry was apparently a comparatively minor matter. But it was well known that in the semi-prone position (about which Americans seem to have gone mad, and which, probably, has become the habitual attitude of repose for the nation) the uterus was the most dependant part of the genital tract, and ballooning of the vagina, gravitation into the uterus, and absorption of mercury would be especially favoured. As to the "germ-resisting power" of the woman he really did not know what was meant. That was a sort of expression of which he had hoped they had heard the last. No woman, however healthy, was proof against septic germs, and one of the sad aspects of puerperal fever was the death of young, blooming, and healthy mothers, who succumbed in spite of apparently perfect health, and, in the old days, in large numbers.

Dr. HERMAN said he had examined the records of the cases admitted into the General Lying-in Hospital in the first half of 1886, 182 in number. Among them there occurred eleven cases of mercurialism, but in two of these it was not quite certain that the symptoms were really due to the mercury. This was a frequency nearly the same as in Dr. Boxall's set of cases. Putting the two sets of cases together, and assuming for the moment that idiosyncrasy was the reason of the mercurialism, it thus appeared that the idiosyncrasy was present in about 5 or 6 per cent. of all cases. He had tabulated his cases in the same manner that Dr. Boxall had tabulated his. He was unable to trace any connection between weather and the occurrence of mercurialism. In only two of his eleven cases was there a temporary trace of albumen present in the urine. He had had under his care in that hospital two cases of Bright's disease with pregnancy, and these were treated with sublimate douches in precisely the same way as the other patients, but did not suffer from symptoms of mercurialism. Nor did his experience show that anæmic patients were specially liable to mercurialism. Of his eleven cases one only was described as pale. None had had more than moderate hæmorrhage in the third stage of labour. He recognised that

Table of all the Cases of Mercurialism occurring in 182 *Women treated*

No.	Reference.	Date of admission.	Para.	Character of labour.	Lacerations.		Sublimate douche discontinued.	Anæmia.	Albuminuria.
					External parts.	Cervix in 1-para.			
1	6	Jan. 8, 1886	3	Natural, 7½ hours	None noticed	—	vi	Not anæmic; hæmorrhage slight	—
2	27	Feb. 12, 1886	2	Natural, 3½ hours	„	—	v	„	None (7th day)
3	34	Feb. 19, 1886	1	Natural, 17 hours	„	None noticed; very slight, if any	vii	Not anæmic; hæmorrhage moderate	None (3rd day)
4	51	March 7, 1886	1	Natural, 17 hours	Perinæum torn nearly to sphincter	Torn bilaterally	viii	„	„
5	81	March 29, 1886	1	Tedious first stage, 52 hours	Slight tear of perinæum	„	iii	Not anæmic; hæmorrhage slight	None (4th day)
6	87	April 2, 1886	1	15½ hours; forceps in 2nd stage, which lasted 2½ hours	Perinæum torn	„	v	„	„
7	88	April 4, 1886	1	Quick, 4 hours	None noticed	No appreciable laceration	viii	„	Trace (3rd day), none (9th day)
8	93	April 14, 1886	2	Quick, 3 hours; delivered in cab	„	—	vi	„	None (4th day)
9	131	May 17, 1886	1	Normal, 17 hours	Slight tear of perinæum	—	viii	„	None (2nd and 10th d.)
10	134	May 20, 1886	3	Twins, 24½ hours	None noticed	—	—	Rather pale; hæmorrhage slight	Trace on 3rd day, none on 8th day
11	143	May 30, 1886	1	Easy, 12 hours	Perinæum torn ½ an inch	—	—	Not anæmic; hæmorrhage slight	None (3rd day)

with Sublimate Douche during the Lying-in Period (Dr. Herman).

Purge given.	Bowels.	Mouth and gums.	Teeth.	Tongue.	Temperature.	Remarks.
Mag. Sulph. ℥j, Mag. Carb. ℥ss, Tr. Bellad. ♏v, Ess. Menth. Pip. ♏xv, Aq. ℥j, on 3rd day	Loose; stools containing mucus and blood	Swollen and tender, salivation	—	Slightly furred	102·6° on evening of 4th day; normal next day	Earache the only cause discovered for rise of temperature
,,	No diarrhœa	Mouth tender; gums tender	Felt loose	Thin white fur	Normal throughout	—
,,	Loose; offensive, greyish	Gums red, not sore	Not loose	,,	Normal till 10th day; then rise to 100·4°; the 12th day to 101°	Elevation of temperature of only a few hours' duration, probably due to emotional causes
,,	Loose on 6th day, not afterwards; no pain	Gums spongy and red on 8th day	—	—	101° on evening of 7th and 8th day; normal till then	Lochia offensive on 8th and 9th days
,,	Loose on 5th and 6th days	Gums sore and red	—	Ulcer on tongue due to sharp tooth	100·4° on 5th day; 101° on 9th evening; at no other time over 100°	—
,,	No diarrhœa	Bad taste in mouth	—	—	Normal throughout	—
,,	Diarrhœa and slight pain in abdomen on 6th day; vomited on 7th day	Gums sore on 3rd day	—	Dirty	100·4° on 8th day; otherwise normal	—
,,	Loose; motions containing mucus and blood; much pain in abdomen	—	—	—	100·4° on evening of 6th day; otherwise normal	—
,,	Vomiting; no diarrhœa	—	—	Yellow fur down middle	Normal throughout	Doubtful whether symptoms due to sublimate
,,	Diarrhœa on 5th and 6th days with pain	—	—	—	,,	Diarrhœa followed aperient
,,	Slightly loose	Mouth and gums sore; nasty taste in mouth on 6th day	Not loose	Furred	,,	—

the use of sublimate in midwifery practice had its disadvantages. But, so far as his knowledge of the results obtained in lying-in hospitals went, better results had been got with sublimate than with any other antiseptic. He should be glad if equally good results could be reached with antiseptics free from the danger of sublimate, but this had not been done yet. In private practice he thought the use of sublimate was not safe unless two conditions were complied with: (1) That the nurse who gave the douche should know how the absorption of the agent used was favoured by the ballooning of the vagina, to which Dr. Boxall had referred, the danger of such absorption, and how to prevent the ballooning. The nurses at the General Lying-in Hospital were all carefully instructed on this point. (2) That the medical man should attend at least daily, so that he might early perceive the first symptoms of mercurialism. When he ceased to visit daily, the use of sublimate should be left off. He did not think the sublimate could often enter the system through the uterine veins. If sublimate could flow into them blood could flow out. With regard to what one speaker had said about the germ-resisting power of the patient, &c., he supposed that maintaining the patient's general condition, preventing exhaustion by lingering labour, &c., was meant. The importance of this had long been recognised; generations of accoucheurs had made it their constant aim, but puerperal fever had not been prevented until antiseptics came into use. His experience at the General Lying-in Hospital did not enable him to offer any information as to the effect of sublimate douches in septicæmia, for during the two and a half years that he had been attached to that institution there had been no case of the kind.

Dr. CULLINGWORTH was struck with the fact that almost everyone who had hitherto taken part in the discussion had appeared to assume that vaginal and uterine injections were the essentials in antiseptic midwifery. Little or nothing had been said of what to his mind was of infinitely greater importance, namely, antiseptic cleanliness of hands, instruments, and sponges, and, indeed, of everything brought into contact with the patients' genital tract. It seemed to him well worth considering whether it was really necessary to introduce strong germicide solutions within the body of the patient. It was not the micro-organisms already there that were to be feared, but those that were in danger of being introduced from without. The object of antiseptic midwifery was, or should be, to prevent these offending organisms from gaining an entrance to the genital passages. This was to be done not by injections, but by scrupulous and efficient disinfection of the hands, &c., a comparatively simple and easy process, and one which involved no danger of mercurialising the patient. If the great body of practitioners in this country were to be induced to adopt the antiseptic method in

their private midwifery practice, it must be shown that it could be efficiently carried on in a simple manner. If it goes forth that this mercurial douching of the patient before, during, and after labour was a necessary part of the process, men will vote the whole thing impracticable. It behoved those who, like himself, regarded antiseptics in midwifery as an incalculable boon to the community, to do all they could to encourage its universal practice. One way of assisting in this direction was to reduce the method within practicable compass, by divesting it of details that are non-essential. He quite admitted that warm vaginal injections were both soothing and useful. But was there any evidence to show that these injections need consist of strong germicides? Their value lies in their promoting cleanliness, and that could be attained by the use of harmless ingredients just as easily as by that of powerful poisons such as corrosive sublimate. Even in cases of saprsemia, where the value of at least one thorough intra-uterine injection was undisputed, it was more than doubtful whether a sublimate solution had any advantages over a solution, say of potassium permanganate, or boric acid, or iodine, or chlorinated soda. The immediate disappearance of the symptoms in those cases, as soon as the uterus had been emptied, appeared to show that the sources of mischief there were not living organisms, but chemical products of decomposition. The one indication is, therefore, to remove the putrefying material from the body, and this could be done either by means of the aseptic hand, or by washing out the uterus with some simple, unirritating, and not necessarily germicide solution. Dr. Routh's suggestion that the internal use of corrosive sublimate should be reserved for cases in which septicæmic symptoms have already developed, seemed to Dr. Cullingworth to be rather like proposing to lock the stable door when the steed was stolen. When once the disease germs have gained access to the blood, no douche could reach them.

Dr. Leith Napier considered it advisable to separate the antisepticism necessary or prudent in lying-in hospitals from measures which were applicable in private practice. In the former, mercurial douches might, with due care, be regarded as most suitable. The employment of mercurials was certainly not free from disadvantages, still the perchloride formed a trustworthy, elegant, and unstaining wash. In private practice he preferred hot saturated solutions of boracic acid. He thought hydrargyrismus occurring in 5·5 per cent. of all patients treated hardly admitted of Dr. Herman's explanation of idiosyncrasies. Perhaps unnecessarily strong solutions were used, 1 in 10,000 destroyed micro-organisms, 1 in 1000 their spores. Was it as a prophylactic or as a curative agent that 1 to 1000 was used immediately after labour? Did we postulate the existence of spores of micrococci or bacilli as a universal or common condi-

tion? If not, a much weaker solution would prove sufficient. Besides, the employment of strong solutions defeated the object desired. Solidification of albumen in the uterus occurred, and unless to coat over the uterus (if this were possible), was all that was necessary to prevent septicæmia, it seemed better to employ a solution which by absorption might act not only locally but generally. He ventured to differ with Dr. Boxall's observation that mercury was eliminated chiefly by the intestine, it passed out in all secretions, in the bowel the non-absorbed portion was found as an insoluble sulphide.

Dr. Routh, in explanation to Dr. Cullingworth, stated that he (Dr. Routh) had not said that he never used injections. On the contrary, he almost invariably used iodine or Condy for vaginal injections during the convalescence. As to the good effect of the stronger mercurial solution, "the proof of the pudding was in the eating;" his case was completely cured by it.

Dr. Lewers said that, as the statistics of lying-in hospitals other than the General Lying-in Hospital had been referred to in the course of the discussion, it might be of interest to mention that during the year 1887 there were 962 women delivered in Queen Charlotte's Lying-in Hospital with only two deaths.

Dr. Boxall, in reply, remarked that the direct passage of sublimate into the system, presumably through the venous channels, was quite an exceptional occurrence, and that similar accidents had been noted with other antiseptic fluids, such as carbolic and iodine solutions. But these being altogether beyond the scope of ordinary experience, were left out of consideration in the paper. Ballooning of the vagina and uterus was an incident to be constantly borne in mind. The rules laid down in the paper for the administration of the douche took cognizance of this occurrence. Despite the fact that sublimate acts as a coagulating medium, it does not necessarily follow that the sepsis-destroying power is as local as has been supposed, still less that absorption of mercury is prevented. The coagulum at first formed is soluble in excess of albumen. This is a point not generally recognised, which has an important bearing on the question. Corrosive sublimate brought into contact with albumen is at first precipitated, and mercury in considerable quantity may thus be retained within the passages. But this coagulum being continually acted upon by the albumen of the blood and tissues is redissolved, and in that state is liable to be taken up into the system. The primary precipitation of the mercury tends to retention (hence a further reason, were any needed, for complete evacuation of the uterus), whereas the faculty for being redissolved may ultimately result in a large influx into the tissues. Whether or not the solution of albuminate in excess of albumen is itself a trustworthy antiseptic requires elucidation. In his paper he had not entered upon the com-

parative value of antiseptic agents, but when this subject was previously before this Society he had taken the opportunity of pointing out the antiseptic superiority of corrosive sublimate as compared with Condy's fluid and carbolic acid. This was evidenced not only by an exceedingly low mortality but by an immediate fall in morbility, amounting to an all but total elimination of septic affections, on the introduction of sublimate at the General Lying-in Hospital in May, 1884. As regarded iodine, he would point out in passing that when introduced into the body and cut off from the atmosphere its volatility could not be exerted; hence any argument as to its superiority on that score fell to the ground. Though sublimate had been constantly employed since the date of its first introduction, he wished to point out that with the exception of the cases reported by Dr. Dakin, which all occurred in the latter part of 1885, how very slight had been the symptoms of mercurialism; so slight, indeed, that the nature of some of the cases was suspected rather than assured; for, with the exception of those above referred to, they all conformed to the same mild type as those now given in the table, though 1800 cases or more had been treated in the same way.

OCTOBER 3RD, 1888.

JOHN WILLIAMS, M.D., President, in the Chair.

Present—39 Fellows and 3 Visitors.

Books were presented by Sir Henry W. Acland, Dr. Chaleix-Vivie, Dr. Fort, Dr. Edward W. Jenks, Prof. Lefour, Prof. John Marshall, F.R.S.; Dr. Pinzani, Dr. Waynbaum, the Royal College of Surgeons in Ireland, and the Smithsonian Institution.

William Steer Riding, M.D., was admitted a Fellow of the Society.

Charles Milton Fegen, M.R.C.S (Bedford); John George Johnson, L.R.C.P.Lond. (Swindon); Joseph Theophilus Weston, L.K.Q.C.P. (Mozufferpoor); and Frank Wyatt-Smith, M.B., B.C.Cantab. (Buenos Ayres), were declared admitted.

The following gentlemen were elected Fellows of the Society: — Herbert Campbell Burton, L.R.C.P.Lond. (Blackheath); and William Duncan, L.R.C.P. and S.Edin. (Bristol).

The following gentlemen were proposed for election:— William Macfie Campbell, M.D.Edin. (Liverpool); Charles Newton Cornish, L.R.C.P.Edin. (Bushey Heath); Henry Edward Haycock, L.R.C.P.Edin. (Whitwell); John Mackern, B.A., M.D.Cantab., F.R.C.S.; and John Bland Sutton, F.R.C.S.

A CASE OF CONGENITAL SARCOMA IN A NEW-BORN INFANT.

By John Phillips, B.A., M.D.Cantab., M.R.C.P.

At the July meeting I showed a living child, with a malignant growth on the forehead; death has since taken place, a post-mortem has been made, and the report appended.

The mother, aged 24, was married at sixteen, and this was her eighth child. Four only of the children are, however, alive, and they are extremely rachitic. There is no history of malignant disease to be obtained, and no specific taint could be traced.

While six months pregnant she was pushed against the edge of a table, and bruised at a point midway between the umbilicus and right anterior superior spine of the ilium. She noticed cessation of fœtal movements afterwards for three or fourdays.

Labour took place June 23rd, 1888, and was attended by no difficulty, the woman having a very capacious pelvis. The frontal tumour, which was the size of a small cocoa-nut at birth, bled profusely immediately on the passage of the head through the vulva; hæmorrhage occurred twice afterwards. The origin of the bleeding was the abraded surface of the size of a half-crown at the apex of the tumour.

Two days after birth a small submaxillary swelling on the right side was noticed; this rapidly increased, spreading upwards into the parotid region, and downwards into the neck. Very slight change was noted in the frontal growth; the veins of the scalp became very prominent, and the whole surface congested and purplish in colour.

Up to now the child had taken food well, made weight, and was apparently in no pain, but small growths appeared in rapid succession on the left cheek, in the left submaxillary region, and on the right lower eyelid near the inner canthus. Deglutition became impossible, and death occurred on the tenth day.

CONGENITAL SARCOMA IN A NEW BORN INFANT

Frontal growth with the summit formed of breaking down tissue. The intracranial temporal and parotid growths are also advanced

West Newman & Co. chromo.

The points of interest appear to be four:

1. As to the length of time the tumour had been in existence before birth, and to what extent the blow at the sixth month was responsible for this peculiar perversion of embryonic tissue.

2. The question as to whether an ulcerated malignant mass in passing under strong pressure through the genital tract could not infect locally the mother, through some lesion of the cervix, vagina, or perinæum. The possibility of such an occurrence has not up to now been disproved. On vaginal examination after labour, there was no injury either to the perinæum or vaginal mucous membrane, but the cervix was lacerated, but whether recently or from previous labours it would be impossible to say.

3. Had the tumour been larger or the maternal pelvis smaller, dystocia would undoubtedly have been produced. Herrgott, in his work ('Des Maladies fœtales, qui peuvent faire obstacle à l'accouchement,' 1883), does not mention this condition.

4. The variety of hæmorrhage which occurred in this case may be added to those already enumerated by Ribemont in his thesis ('Des Hémorrhagies chez le nouveau-né,' 1880.)

The case related appears to be unique in our literature, and the only one approaching it in similitude is recorded by Parvin ('American System of Obstetrics,' vol. i, p. 767), when the fœtus caused considerable dystocia from the presence of a myomatous growth of the lower jaw and neck.

Report on Dr. John Phillips's case of Congenital Sarcoma in a New-born Infant.

The following portions of the subject were preserved for examination after the necropsy:

1. The right side of the head and face with the exception of the calvaria, brain, and posterior part of the occipital region.

From the right side of the forehead projected a large, soft, tuberous growth encroaching on the scalp above and the bridge of the nose below and overhanging the right orbit. It had reached the upper lid close to the inner canthus. It measured two and a half inches vertically, one and three quarters transversely, and about one and a half at its thickest portion. A fungating mass protruded from the integument covering its surface. (There was no similar change in any of the other growths in this case.) The periosteum of the frontal bone was not involved. A portion of the growth was prepared for the microscope.

A large mass of new growth, tuberous, covered with bluish, partly adherent integument, was situated below and behind the ear, continuous in front of the external auditory meatus with a growth presently to be described. Deep down it invaded the soft structures in the triangles, reaching to the base of the cranium and to the pharynx. A very soft piece from the lowest part of the mass, below the angle of the jaw, close to the parotid, was prepared for the microscope.

Between the outer canthus and the pinna was a tuberous reniform growth, one and a half inches in horizontal measurement, convex superiorly, concave below and continuous posteriorly with the mass above described. A smaller tuberous growth lay between the lower eyelid and the upper lip.

2. The right parotid with the pinna and adjacent integument. A soft, flattened, superficial nodule, a quarter of an inch in diameter, lay in the substance of the gland.

3. The right lung. No nodules could be detected in its substance. A small nodule lay between the pleura and one of the intercostal muscles posteriorly.

4. A part of the liver containing a superficial nodule of new growth an eighth of an inch in diameter. It was prepared for the microscope.

The following is an account of the microscopic appearances:

The main growth on the right side of the forehead was

FIG. 1.

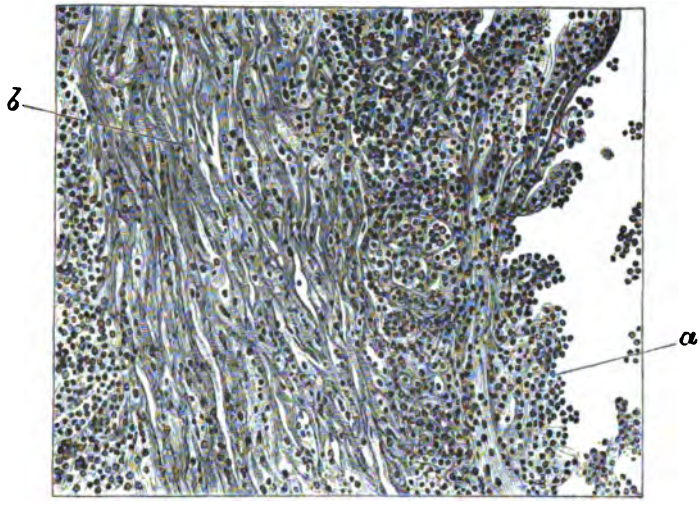
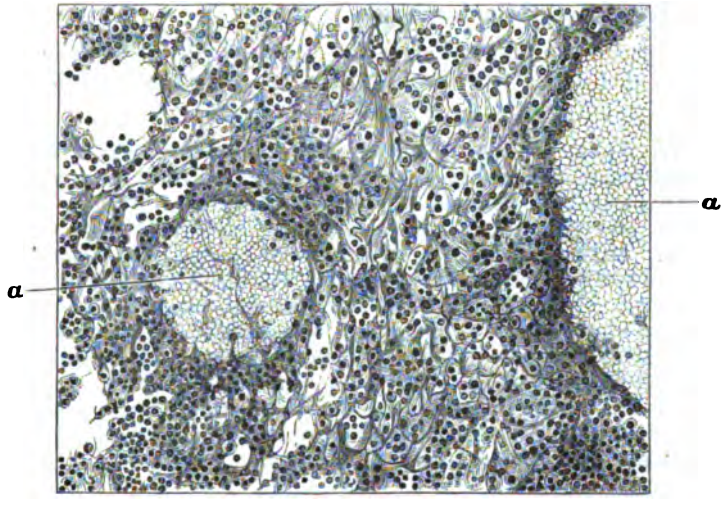


FIG. 2.



made up of round-cells (Fig. 1, *a*.) and of nuclei resembling the nuclei of round-cells. These structures infiltrated the connective tissue forming the subcutaneous tissue between the skin of the forehead and the periosteum (*b*). The section strikingly resembled a periosteal sarcoma, but the tumour was not even adherent to the periosteum.

A section from the large mass below and behind the parotid gland was almost entirely made up of round-cells and nuclei (Fig. 2). The connective tissue was scanty, but some adipose tissue was found. Several vessels, some very wide, with walls made up of the tumour tissue, were seen, and the round-cells, with a few small spindle-cells, were detected in the midst of collections of extravasated blood which was organising in parts; the threads of fibrine mixed with cells gave an appearance of lymphoid tissue (*a a*).

A section from the liver showed collections of round-cells and nuclei forming an area, at the periphery of which the cells were seen infiltrating the normal substance of the liver.

The morbid growths were round-celled sarcoma. The primary tumour was developed in the subcutaneous connective tissue of the forehead.

JOHN PHILLIPS.
ALBAN DORAN.

Mr. ALBAN DORAN observed that the tumour was a true round-celled sarcoma, precisely resembling that form of sarcoma as seen in adults, yet evidently developed in fœtal life. It had arisen amongst tissues which lost their embryonic type very early. He intended to exhibit before the Pathological Society a pair of tumours from a seven-months' fœtus. Under the microscope the solid part of one of these tumours was found to contain an abundance of round-cells. On careful comparison, however, Mr. Doran noted that the tumour tissue precisely resembled the parenchyma of the ovary of a four-months' fœtus outside the follicles. Hence the tumours were hardly round-celled sarcomata, but rather masses of ovarian parenchyma, the development of which had been arrested.

OVARIAN CYSTS WITH MUCOUS MEMBRANE.

By J. Bland Sutton, F.R.C.S.

Some months ago I put forward the opinion that many ovarian cystomata, especially those known as *multilocular glandular cysts*, or *ovarian adenomata*, present a lining membrane which, in its physical characters is indistinguishable from mucous membrane. The histological features of such membranes also support this opinion in the strongest manner possible, for not only are they covered with a regular layer of columnar epithelium, but present glands of some degree of complexity, indistinguishable from mucous glands; further, the fluid contained in such cysts is identical with mucus. As this view of the nature of the lining membrane of certain ovarian cysts is of some novelty as well as of interest, I thought it would be useful to exhibit a few of these cysts which may be regarded as type forms.

The cysts of the ovary in which mucous membrane occurs belong to the group which arises in the region of the ovary to which I have applied the name *oöphoron*; their actual origin is in the ovarian follicles.

This is excellently shown in Fig. 1, representing a section of a human ovary in its major axis. In this specimen the *oöphoron* is sharply demarcated from the paroöphoron as it is occupied by a number of cysts. The parovarium has also been dissected to show its relation to the paroöphoron; it possesses seventeen tubules, a very unusual number. The specimen has long been preserved in the museum of the Middlesex Hospital, but I have re-examined and dissected it for the purposes of this paper.

The clinical histories of these specimens have no bearing on the opinions advanced, therefore it is undesirable to encumber my communication with such details, but simply

exhibit the specimens and describe their characters. The simplest specimen is a cyst which contained about two quarts of thick mucus. Although for practical purposes it

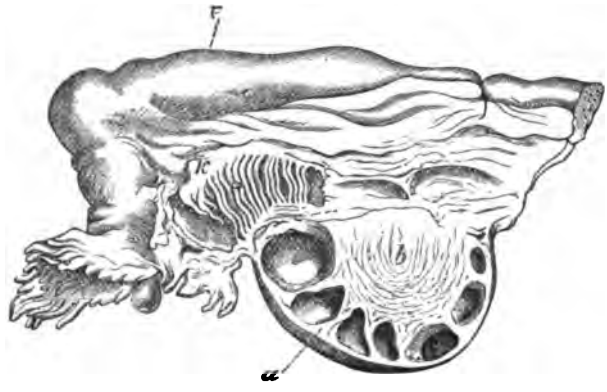


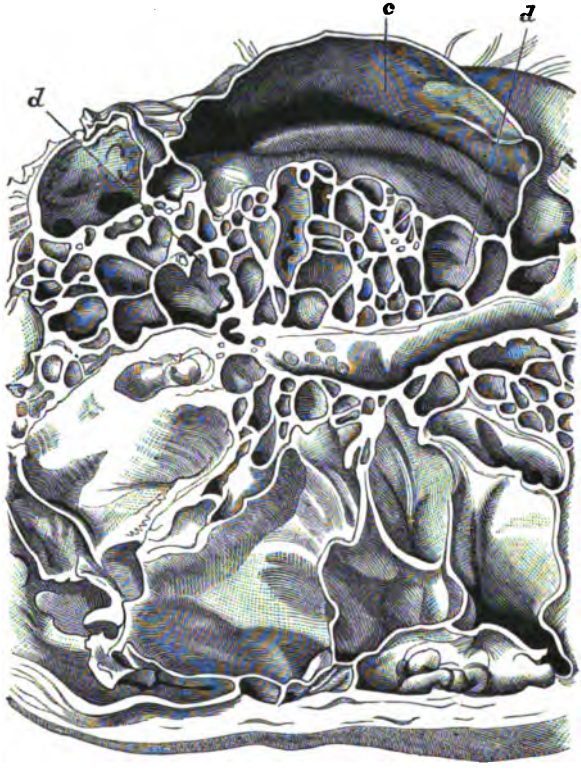
FIG. 1.—Transverse section of the human ovary, to show the regions: *a*, oöphoron; *b*, paroöphoron; *k*, Kobelt's tubes; *P*, par-ovarium; F, Fallopian tube.

was unilocular nevertheless its walls lodged ten to fifteen cysts, of sizes varying from a Tangerine orange to a cocoa-nut. The interior of the main cyst was lined with a soft velvety covering, pink in colour, presenting, here and there, some slightly projecting masses resembling the cotyledons of a ruminant's uterus shortly after delivery at term. The walls of the cyst when examined microscopically were found covered with a single layer of most regular columnar epithelium, which dipped down in many places to form mucous glands, especially in the neighbourhood of the cotyledon-like clumps.

From this, which may be considered the most simple form, we can derive other more complex and nearly solid cysts. In Fig. 2, a portion of an ovarian cyst is represented; it belongs to the form designated "multilocular glandular cyst," and an examination shows that very many of the cysts are filled with tissue resembling honeycomb.

In the recent state the spaces in the honeycomb portion were filled with mucus. An examination of the reticulated mass marked *d* shows that the solid portion of the cyst occupies from a third to one half the cyst, and the honey-

FIG. 2.



comb portion is made up of small cavities lined with epithelium of various shapes. The large cavity with the honeycomb portion is a primary cyst, the spaces in the honeycomb are secondary cysts. These secondary cysts are indistinguishable from the mucous retention cysts found in mucous membranes, indeed the solid masses are to all

intents and purposes adenomata on the type of mucous glands.

The restriction of the glandular material to a definite portion of each cyst induced me to examine systematically various parts of the cyst wall in these specimens, and I found that the glands in these cases are not uniformly distributed in the lining membrane, but restrict themselves to certain districts, where they cluster together like colonies of barnacles on a ship's bottom, or as colonies of ascidians on a rock. This restriction of the glands to certain regions of the cyst membrane is noteworthy, as it helps to explain why some observers maintain that the glandular masses in these cysts are ingrowths from without, whereas the truth is they are outgrowths or downgrowths from the epithelial lining of the cysts.

In order to show how unequally the glands are distributed in these adenomatous cysts I have represented three incipient cysts in juxtaposition (Fig. 3). Thus the cyst *a* is absolutely barren of glands, and its walls do not exhibit any definite layers of cells. The cyst *b* is an advance upon this and presents one small cluster of glands, whereas the cyst *c* has a considerable portion of its cavity occupied by glands, and, like *b*, is lined with regular columnar epithelium. We have to guard against mistaking a cyst in which the glands and epithelium have tumbled out during the preparation for a barren cyst, but every gradation may be traced, so that error from this source interferes but little with the main result. It is also extremely suggestive to find the glands collected at one spot resembling the signet-ring disposition of the membrana granulosa in the normal ovarian follicle.

The apparently curious restriction of the gland-clusters in ovarian adenomata to one third of the circumference of the cyst is a very significant fact, and I would point out how strikingly this corresponds to the distribution of the cells in the ripe ovarian follicle. The ovum of mammals differs remarkably from that of other vertebrata by the fact that it is lodged in a follicle, the walls of which

are arranged two or more rows deep, the superficial cells being more or less columnar, the ovum is embedded in a

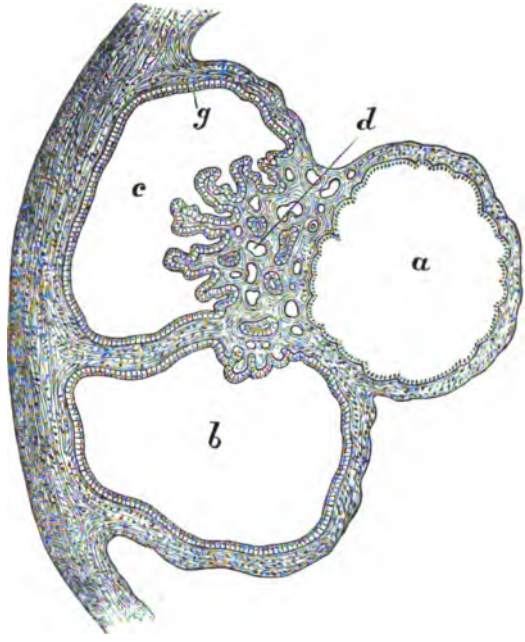


FIG. 3.—Three incipient cysts, to show the unequal distribution of the mucous glands. In the cyst (*c*) the membrana granulosa is indicated by *g*, and the cluster of glands by *d*.

cluster of cells, the discus proligerus; over the discus, the surface cells are more distinctly columnar than elsewhere (Fig. 4). Further, the membrana granulosa has a secretory function inasmuch as it furnishes a fluid, the *liquor folliculi*, which distends the ripe follicle. If we compare the mature ovarian follicle with a loculus of an ovarian adenoma, be it large or small, taking care, however, not to mistake a secondary for a primary cyst, we shall find the parts arranged on precisely the same pattern; thus we shall find a cyst clothed with columnar epithelium, or if it

be large, somewhat flattened by pressure; projecting into the cyst is an eminence, the discus proligerus, beset with

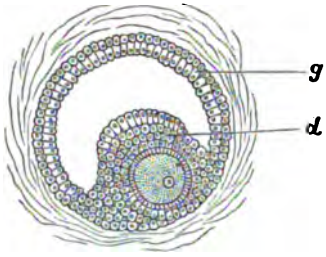


FIG. 4.—A normal follicle. *g.*, Membrana granulosa; *d.*, discus proligerus.

mucous glands if the cyst is small, their secretion distending the unoccupied portion of the cavity. When the cyst

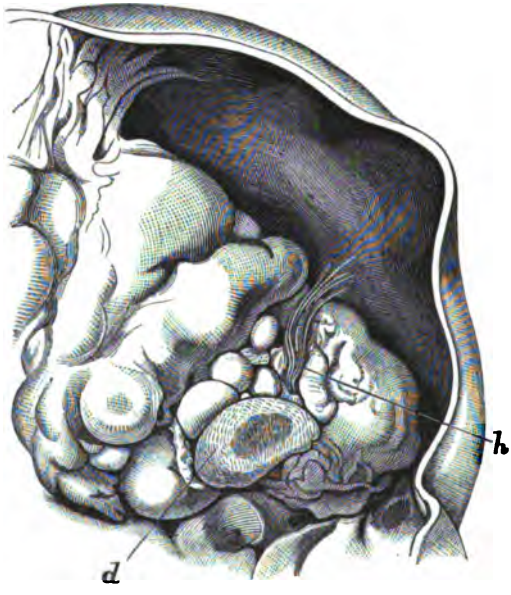


FIG. 5.—An ovarian adenoma (dermoid with mucous membrane), presenting a cutaneous clump with a tuft of hair.

is large the enormous discus proligerus is on section like a honeycomb; the acini of the glands have become cysts by retention. Figs. 2 and 4 should be compared for this purpose. As additional evidence in support of the view that ovarian adenomatous cysts lined with mucous membrane ought to be classed as dermoids, attention may be drawn to a portion of a multilocular cyst preserved in the museum of St. Thomas's Hospital, the larger portion is occupied by adenomatous material and mucous retention cysts, whilst sprouting into one of the larger cavities is a lock of hair. This is of great interest because mucous membrane may, and does, produce hair, especially under pathological conditions (Fig. 5).

The study of the earlier stages of these cysts is of importance because it shows that the term adenomata, applied to these cysts, is a perfectly just one, and an adenoma cannot arise but from pre-existing glandular tissue.

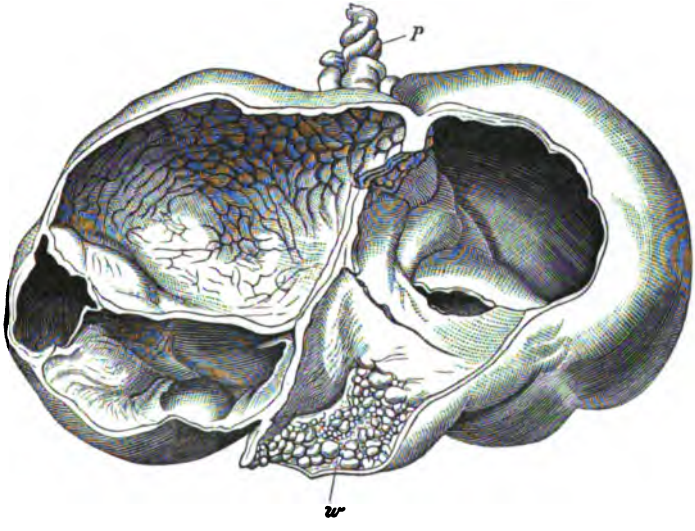


FIG. 6.—A multilocular (non-glandular) ovarian dermoid. It has no cutaneous appendages. The pedicle was twisted.

In Fig. 6 is represented a multilocular cyst of the oöphoron

presenting papillomatous outgrowths in some of its loculi. On microscopic examination, the cyst was found to be lined with flattened epithelium, in some places several rows deep. As it contains no hair or sebaceous glands I hesitate to call its lining membrane skin. Yet if I could find a mucous gland it could be classed as mucous membrane. In the absence of any other distinguishing feature it must be classed as a non-glandular multilocular cyst. For all that, I believe it to be a feebly-developed dermoid. The presence of skin does not imply the absence of mucous membrane in the same cyst, for again and again have I cut mucous retention cysts in ovarian dermoids, and the three cysts lined with glandular mucous membrane represented in Fig. 3, were from a typical ovarian dermoid, indeed, so constantly is skin and mucous membrane associated in ovarian dermoids, that a cyst lined with mucous membrane or skin should equally come into the category of dermoids.

As a result of this study, I would define dermoids as *cysts or tumours furnished with skin or mucous membrane, occurring in situations where skin and mucous membrane are not normally found.*

Adopting this definition, more than three fourths of the cysts arising in the oöphoron must be classed as dermoids.

Mr. ALBAN DORAN was glad that Mr. Sutton had demonstrated his opinions from actual specimens. Dr. Poupinel was the first to show (in the 'Archives de Physiologie,' series 3, vol. ix) that the difference between a common multilocular and a dermoid cyst lay only in one point. In the former the cyst was lined with true mucous membrane, in the latter with skin. Hair and teeth growing from skin were no greater mysteries, said Poupinel quite rightly, than complicated glandular structures, such as are often found in multilocular cysts. Mr. Sutton had confirmed Poupinel's theory by accurate demonstration. The multilocular cystic tumour and the dermoid cyst both arose from the oöphoron, hence the dermoid, like the commoner cyst, seldom burrowed between the layers of the broad ligament, after the manner of hilum-cysts. The most important part of Mr. Sutton's demonstration was that which dealt with the nature of the normal Graafian follicle. Mr. Sutton appeared to imply that it was simply a mucous crypt.

Dr. W. S. A. Griffith stated that he was unable to accept Mr. Sutton's conclusions, and reminded Mr. Sutton that while very many ovarian cysts presented an internal surface strikingly resembling mucous membrane to the unaided eye, under the microscope not even a trace of epithelium, nor any tissue resembling mucous membrane could be seen, nothing but condensed connective tissue.

Dr. Champneys doubted whether the mucous membrane of the mouth could be considered in a true sense mucous membrane, the mouth being developed as an invagination of the surface. The extent to which hair grew over such a surface might easily be supposed to vary. If a rodent, or other animal, were to grow hair on its intestine, that would, he thought, be a different matter.

Mr. Bland Sutton, in reply, said the facts he had mentioned formed a small part of a very large question, and had been advanced with the view of exciting an interest in the matter, and he intended to deal with it in detail shortly. The views advanced were forced upon his notice whilst engaged in working out the evolution of the central nervous system of vertebrata, and he could adduce facts to show that the membrana granulosa was potentially mucous membrane. Although skin and mucous membrane in their most typical conditions seem to possess little in common, nevertheless when critically analysed they are found to be fundamentally identical. Dr. Griffith's remarks were not serious, for he failed to appreciate the fact, well known to pathologists, that when cavities lined with mucous membrane become greatly distended, the lining membrane loses its distinctive features and finally atrophies, *e.g.* a cystic vermiform appendix or hydrops vesicæ felleæ.

DESCRIPTION OF A NEW OPERATION FOR VESICO-UTERINE FISTULA.

By Francis H. Champneys, M.A., M.D.Oxon., F.R.C.P.

(*Abstract.*)

(Received September 30th, 1887.)

The author relates a new operation for vesico-uterine fistula, with description of a case.

The cervix being held down, the anterior vaginal wall was dissected away from the cervix as far as beyond the fistula, leaving a hole in the bladder and another in the cervix. These were closed, and the vaginal wall repaired, with complete success.

The author compares this operation with those in use, and enumerates what he believes to be its advantages, together with certain alterations which he would make in subsequent operations.

Vesico-uterine fistula is a rare lesion, and this fact may partly account for the unsatisfactory character of its treatment. This is comprised shortly in attempts to close the cervical canal by sewing up the os externum, and in attempts to close the orifice of the fistula by splitting the cervix and getting at the hole in its wall. The operations are both far from satisfactory; the first, because it mutilates the patient on a comparatively slight pretext; the latter on account of the splitting of the cervix which it entails, and on account of the quality of the cervical tissue, which is ill adapted for plastic operations.

A prolonged search through the literature of the subject has resulted in the brief statement above, and it is there-

fore thought unnecessary to inflict on the Society a list of authors and their opinions.

The performance of the operations of supra-vaginal amputation of the cervix and vaginal extirpation of the uterus, suggested to the author another mode of operation which he has lately carried out in a case of vesico-cervical fistula with complete success. As he may wait long for a similar case, he prefers to communicate this single case to the Society.

The notes of the case, from which the following account is taken, are by Mr. H. M. Page, Obstetric Assistant at St. George's Hospital.

E. M—, aged 38, married sixteen years ago, a widow fourteen months, was admitted into St. George's Hospital on March 28th, 1887.

She had had four children, of which only one (the first) survived. No miscarriages. The second child lived three and a half years and died of scarlet fever; the third was born dead; the fourth lived twenty-four hours.

The labours have all been severe, instruments being used in the two last. The pelvis was generally contracted and flattened, with a diagonal conjugate of four inches.

The last child was born September 30th, 1886. Labour lasted three days, the child was delivered by forceps, vertex presentation, no difficulty with the after-birth. Got up on the fourteenth day and was well but for trouble with her water, which ran away from the front passage, and not the water passage, on the same day as the child was born, and has done so ever since.

Per vaginam. — Cervix rather large and flabby, os externum admits finger for one inch. No cicatrices felt, parts otherwise normal.

Per speculum.—Vagina filled with clear fluid like urine. A pledget of wool having been placed in the cervical canal, milk was injected into the bladder, and, on withdrawing the plug, was seen to flow in a small but powerful stream from within the right side of the os externum. A bent probe, passed through the urethra, was made to enter the

fistula, the orifice of which was felt to be about half an inch within the canal, in the right side of the anterior lip. A silk thread was drawn through the fistula to irritate the edges, and a self-retaining catheter passed into the bladder and kept in.

This treatment was pursued till May 12th, but the fistula remained as before, in spite of careful drainage.

On May 12th, 1887, under ether, the patient being in the lithotomy position, I passed a long probe through the urethra, and brought it out of the cervix, bending it slightly; the two ends lay—the front end in front of the pubic arch—the hinder end in front of the perineum, and kept the cervix well down; a volsella was also used to steady the anterior lip.

A transverse incision about one and a half inches long was made at the reflection of the anterior fornix vaginæ from the cervix, and the bladder dissected from the cervix by scissors and fingers, as in vaginal extirpation of the uterus and supra-vaginal amputation of the cervix. As soon as the probe was exposed, a thick silk thread was drawn through the fistula, and the dissection carried on until the operator got above the fistula, which appeared as a round hole in the bladder, and another in the cervix, each admitting the middle finger easily.

No freshening was required, as the whole surface was necessarily raw.

Seven fine silver sutures were used to close the fistula, being passed from side to side, being entered about one eighth of an inch from the hole in the bladder, and brought out on the edge of the hole, avoiding the mucous membrane. Four similar sutures closed the hole in the cervix. After closure, milk was injected into the bladder, and though a little oozed between the stitches, the edges were seen to be in good apposition. These sutures were cut short. The vaginal wall was then united to the cervix by four silver sutures left long, and subsequently removed. A self-retaining catheter was introduced into the bladder, and the vagina stuffed with gauze soaked with corrosive sublimate.

The bladder was afterwards occasionally washed out with boracic acid lotion, and the vagina with corrosive sublimate solution, being afterwards stuffed with iodoform gauze. The gauze was discontinued on May 1st.

Temperature normal throughout.

Not a drop of urine passed through the fistula, and the result was completely successful, micturition being re-established quite normally.

Remarks.—The fistula seems to have been produced by injury with the forceps, and not by sloughing, unless the patient was mistaken in her statement, on the truth of which she insisted, viz. that the urine flowed the wrong way from the first.

The ease with which the dissection of the bladder from the cervix may be accomplished will be recognised by any-one who has performed the operations mentioned above, and the avoidance of cervical tissues is a distinct advantage. Besides this, two broadish surfaces are united, and it is quite likely that the holes in the bladder and cervix after dissection will not be exactly opposite each other, which again would assist healing if the tissues were not inclined to heal promptly. The two holes in the bladder and cervix are thus probably of advantage.

I used silver sutures because I was very anxious not to fail in a new operation on account of the sutures. Recent Cæsarian sections show how safely silver sutures may be buried. In subsequent operations I should be inclined to try silk or chromic gut, so great is my belief that fistulæ will be easily and successfully closed by this method.

Dr. Percy Boulton said that although he had had a large experience of the injuries of the female bladder, he had seen few cases of vesico-uterine fistula, and that in each of the cases that he had treated the anterior lip of the uterus had been torn through at the time of the accident up to the seat of the fistula. He had repaired each case in a similar fashion, deeply denuding the opening of the fistulous tract at its uterine end, closing this by means of a single "purse-string" suture, and at the same time restoring the torn cervix by means of an ordinary

Emmet's operation, the top suture of which made the fistula doubly secure. Dr. Boulton thought the day had passed for saying that it was necessary or advisable to avoid uterine tissue, which late experiences showed was as susceptible of repair as any other tissue of the body. In Dr. Champneys' case the fistula was only half an inch within the cervix, the os was patulous, and he was able to pass a probe through the bladder and fistula into the vagina and draw down and evert the uterine lip. Dr. Boulton thought that it would have been easy to pare and stitch such a fistula from the intra-uterine side, and, if necessary, the cervix might have been further dilated to make room by means of Hegar's dilators. Dr. Boulton saw certain objections to Dr Champneys' operation: 1. It did not seem desirable to cut through the vaginal fornix and open up the pelvic cellular tissue, not on account of any remote danger to the peritoneum or ureters, but because a urinous fistula was cut across, and the urine was freely bathed over the part during the whole of a long operation. 2. The amount of repair necessary was more than trebled, since there were three large openings to close instead of one small one, and Dr. Champneys had to use as many as fifteen silver sutures. 3. All the sutures put into the bladder and uterus were shut up and left behind, seven in the bladder and four in the uterus. Dr. Champneys had compared this with what was done in certain abdominal operations, but, *e. g.* in Sänger's Cæsarian operation there was no alternative to leaving the sutures behind, whereas in a vesico-uterine fistula it was entirely a matter of election, for it had never been done before, though scores of vesico-uterine fistulæ must have been cured. Dr. Boulton thought that it was too soon even now to decide what might be the remote issues of an operation in which eleven silver sutures were left behind, as, months afterwards, one of the stitches in the bladder might work into that viscus and become the nucleus of a vesical calculus, or, if the patient became pregnant, for the sutures in the cervix to be the starting-point of fresh trouble at the time of delivery. Dr. Boulton offered these criticisms on a new procedure in a branch of plastic work in which he was much interested, and not in any way to detract from the ingenuity and skill which had brought an interesting case to a successful issue.

Dr. HERMAN would not have ventured to comment on this paper were it not that he supposed that there was no one present who could, any more than himself, criticise this operation from experience of it. Judging from the description they had heard, he thought the operation was a great improvement in the treatment of these cases. He would suggest that the objection raised by Dr. Boulton as to the undesirability of leaving so many silver sutures in the parts, could be met by using catgut, which might be left with confidence that it would be absorbed.

If this were done, there would, he thought, be no need for packing the vagina with gauze.

Mr. DORAN alluded to Dr. Bozeman's recent publications on urinary fistulæ. That authority recognised two obstacles to the successful repair of large fistulæ. The vaginal and vulvar tissues were in an unhealthy condition on account of the constant overflow of urine. The urine itself was abnormal, for in these severe cases the bladder was inflamed, and the inflammatory process extended, according to Dr. Bozeman, up to the kidney. He therefore adopted a "drainage support" to the vagina, so as to protect that channel, and catheterised the ureter, washing out the kidney till the urine became healthy. The fistula was then repaired. Dr. Bozeman had recently attempted the cure of pyelitis by cutting into the bladder, establishing a fistula, and washing out the kidney through the ureter. He claimed success in this novel procedure, which at least deserved notice as the work of a well-known operator who might find imitators in this country.

In reply, Dr. CHAMPNEYS thanked those gentlemen who had criticised his procedure. As regarded the sutures, he had in his paper explained at length the reasons why he chose silver for a trial operation, and had there stated that in future he would use silk, or perhaps chromic gut would be preferable. As regarded the operation, he did not think that, with antiseptic irrigation, there was any reason to dread opening up the cellular tissue, nor the passage of a few drops of urine. He thought that it was surely preferable to close a fistula at its orifice and practically throughout its course, to attempting its closure at the distal end only. Uterine tissue would of course heal, but it was not nice tissue to work in. If Dr. Boulton had not performed vaginal extirpation of the uterus or supravaginal amputation of the cervix, he thought he would be astonished at the ease with which the bladder could be approached by the route indicated, and he verily believed that whoever once operated by the method described in the paper would use no other in future.

ON THE VALUE OF PILOCARPINE IN PREGNANCY, LABOUR, AND THE LYING-IN STATE.

By JOHN PHILLIPS, B.A., M.D.CANTAB., M.R.C.P.,
PHYSICIAN TO THE BRITISH LYING-IN HOSPITAL.

(Received February 1st, 1888.)

(*Abstract.*)

THE author gives as his reason for bringing this subject forward the uncertain and diverse opinions held upon the value of pilocarpine. He has treated the questions at issue under five heads. The use of pilocarpine (1) as an abortive; (2) For the induction of premature labour; (3) Intra-partum; (4) Post-partum and during the puerperium, and (5) In albuminuria with or without eclampsia.

Seven cases have been experimented upon and the results given in detail. Forty-eight cases under the second heading have been collected from all sources, of which twenty-seven have been arranged in Tables I and II, while two original ones have been appended in full. The author concludes that five only of these can be considered as unqualified successes and thinks that pilocarpine is able in a certain number of cases to induce labour, but that it is not in any way reliable as an ecbolic; those cases in which there is a tendency to premature termination of pregnancy being most suitable for its administration.

Pilocarpine intra-partum, is considered under three heads:—(α) the "latent period" of labour; (β) the dilating stage of labour; (γ) the expulsive stage of labour. Five instances occurred in the author's practice, and in one sphygmographic tracings were taken at various intervals. The result of thirty-nine cases is worked out, twenty-eight being successes, and eleven failures.

The author concludes that during the dilating and expulsive stages of labour pilocarpine is equally productive of increase and intensification of labour pains with ergot, but with more certainty of action and with none of its ill-effects. Cases of simple uterine inertia are the most suitable for its administration. The drug is useless post-partum and to stay hæmorrhage.

In Table III the results of thirty-nine published cases of puerperal eclampsia have been given with recovery of thirty-one mothers and eight maternal deaths, or 20·5 per cent. Although good effects were produced in twenty-eight cases, yet in nine such dangerous symptoms manifested themselves that the author is bound to warn others against its use, especially when coma is pronounced. He recommends bleeding in conjunction with pilocarpine where it will not act alone, and adduces evidence to show that the mortality is not greater under this mode of treatment than in any other. Statistics of treatment by other methods are given and the results compared. The question of the reason why pilocarpine is productive of uterine pains is discussed and three theories given; the "latent period" of the drug is referred to and illustrated by cases.

Further remarks are made upon: The action of pilocarpine on the fœtus (with Table IV), complications attendant on its use, the proper dose for administration, and contra-indications.

The paper terminates with conclusions as to its value and the precautions to be observed when it is used.

In the following paper it has been my object to give the results of a series of experiments made with pilocarpine, upon patients in the various stages of pregnancy, labour, and the lying-in state, with the view either of banishing it entirely from the present list of ecbolics, or, by suggesting certain definite rules for its administration, to give it a recognised position in obstetrics. Unfortunately, the published results of English authorities are limited to three or four papers, but in Germany obstetricians have devoted much labour and research to this subject, and it is in their literature that I have found the most valuable information and the largest accumulation of facts.

The well-known diaphoretic powers of pilocarpine sug-

gested its use in albuminuria complicating pregnancy, and while treating two cases of this kind Massmann* first accidentally discovered another valuable property, viz. that of inducing labour pains. These cases caused a considerable stir at the time, and it was hoped that a successful rival to the much-abused ergot had at last been found. It was declared that the drug could create labour pains and produce them during the extraction of the placenta and in the lying-in period (Schauta, Welponer, and Kleinwächter). Finally, that its action on the uterus during labour (*intra partum*) was most marked (Sänger). These views have met with much opposition, and although this is somewhat unjustifiable, it will be found that considerable modification of them must take place.

* 'Centralblatt f. Gynäk.,' 1878, Bd. ii, p. 193.

TABLE I.—*Successful Cases of Induction of Premature Labour by means of Pilocarpin or Jaborandi.*

Case.	Age.	Parity.	Period of pregnancy.	Reasons for induction.	Injections.	Result to Ch.	Result to Moth.	Remarks.	Observer.	Reference.
1	?	III-p.	8½ mos.	Forceps in 2 previous deliveries; conjugate diameter 7 cm. (–)	P. 2 cgr. 4 times daily for 3 days	D.*	R.†	No effect 1st day; os uteri size of florin 2nd day; labour spontaneously 3rd day	Wilmart	La Presse Méd. Belge, 1880, xxxii, p. 49.
2	22	I-p.	8 mos.	Contracted pelvis	mxx of 2 p. c. sol. P. injected twice	A.	R.	Pains appeared 3 hours after 1st injection; rapid progression of labour and softening of cervix	Schauta	Wiener medicinische Wochenschr., 1879, No. 19.
3	?	II-p.	8 mos.	Rachitic pelvis; perforation in 1st labour; conjugate 7·5 cm.	P. 2 cgr. injected 4 times, with intervals of 3 hours	?	R.	After 4th injection full dilatation; version and extraction	Heylen	La Presse Méd. Belge, 1879, xxxi, No. 33.
4	?	I-p.	7 mos.	Contracted pelvis	P. 2 cgr. injected 3 times	?	R.	Labour normal; pains followed each injection	Pasquali	Atti Acad. Med. di Roma, 1879, v, 61—80.
5	30	IV-p.	8 mos.	Albuminuria; enormous œdema of feet and vulva	P. 2 cgr. injected, copious physiological effects	A.	R.	Awoke after injection with water dribbling away; labour soon after came on	Massmann	Centralblatt f. Gynäk., 1878, Bd. ii, p. 193.
6	?	III-p.	?	Albuminuria; œdema great; rupture of skin and erysipelas	P. 2 cgr., no disagreeable effects	A.	R.	Membranes ruptured in 5 hours, and labour soon set in	Massmann	Ditto, ditto.
7	31	III-p.	33rd week	"Giant pelvis," contracted in conjugate diameter; vesico-vaginal fistula with each labour	P. 2 cgr. injected twice, with an interval of 6½ hours	D.	R.	Slight pains 2 hours after 1st and 1 hour after 2nd injection; version necessary	Kleinwächter	Archiv für Gynäk., 1878, Bd. xiii, p. 280.

* D. = Dead. A. = Alive. † R. = Recovered. D. = Died.

Case.	Age.	Parity.	Period of pregnancy.	Reasons for induction.	Injections.	Result to Ch.	Result to Moth.	Remarks.	Observer.	Reference.
8	35	VII-p.	37th week	Rachitic pelvis; forceps 2nd and 4th labours; perforation in 6th	P. 2 cgr. injected 4 times	D.	R.	Slight pains after 1st injection, none after 2nd, slight after 3rd and 4th, and 5 hours later labour began	Kleinwächter	Archiv für Gynäk., 1878, Bd. xiii, p. 442.
9	—	—	7 mos.	Pelvic contraction	P. nitrate gr. ½ used, 8 injections, 2 a day; after 4th dose increased to $\frac{5}{12}$ gr.	A.	R.	Great depression after 1st injection; labour began 48 hours after 1st injection; Barnes' bags and forceps necessary	Clay	Lancet, 1879, vol. i, p. 52.
10	20	II-p.	7 mos.	At previous labour cervical and labial bilateral incision necessary, followed by rectal abscess; slight pelvic contraction	2 injections P. 2 cgr., then ·002 grms. Atrop. Sulph.; 3 further injections P., 5 days' interval, with douches; then 6th injection	A.	R.	After 2nd injection pains occurred, 1 in 4½ min.; atropine stopped them; after 6th injection in 2 minutes continuous pains	Sänger	Archiv für Gynäk., 1879, Bd. xiv, p. 75.
11	27	III-p.	8 mos.	Contracted outlet; at 2nd pregnancy induction by bougie at 8 months	1st injection 2 cgr. P., followed in an hour by 2nd of 1 cgr.; 3rd injection 3 cgr. P.; 4th 3 cgr. P., followed in an hour by 2 cgr. P.	A.	R.	12 grms. ergot previously, then 24 hours' interval; pains followed each injection of P.	Schlossberger	"Pilocarpin als wehenerregendes und wehenbeförderndes Mittel." Inaug. Dissertation, Tübingen, 1879, p. 13.
12	27	V-p.	8½ mos.	Generally contracted pelvis; all labours occupied 2 days; left femur atrophied	1st injection 2 cgr. P., followed in 4¼ hours by 2nd injection 3 cgr. P.	A.	R.	Pains appeared 28 min. after 1st injection, and 24 pains appeared in the hour following 2nd injection; labour 21 hours	Schäbel	"Über die Einleitung der Künstlichen Frühgeburt durch Pilocarpinum Mur." Inaug. Dissertation, Tübingen, 1879, p. 15.

TABLE II.—*Cases of Failure of Induction of Premature Labour by means of Pilocarpin.*

Case.	Age.	Parity.	Period of pregnancy.	Reasons for induction.	Injections.	Result to Ch.	Result to Moth.	Remarks.	Observer.	Reference.
1	37	II-p.	8½ mos.	Contracted pelvis; craniotomy at 1st labour	3 injections P. 2 cgr., then after 24 hours' interval 2 others; after 48 hours 2 others	A.	R.	After 5th injection, douche given and sponge-tent introduced; P. produced no pain at any time	Kröner	Archiv für Gynäk., 1880, Bd. xv, p. 92.
2	22	I-p.	—	Flat, rachitic, generally contracted pelvis	3 injections P. 2 cgr., with 5 hours' interval	A.	D.	20 pains followed 5 minutes after 1st injection, 15 after 2nd, with diminishing intensity; slight contractions after 3rd; bougie inserted	Bergesio Libero	Annali di Ostet. Milano, i, 1879, p. 99.
3	30	IV-p.	7½ mos.	1st labour forceps; 2nd and 3rd induction at 8th month; rachitic pelvis	3 injections P. 2 cgr., with a 36-hour and 24-hour interval	A.	R.	Full effects of P. produced, but no pains; catheter introduced	Cuzzi	Ditto, p. 22.
4	30	I-p.	8 mos.	Epilepsy and (?) progressive pernicious anæmia	5 injections P. 2 cgr.	A.	R.	With 5th injection syringe inserted into uterine cavity; 1½ hour after violent epileptic attack; no pains after any of injections	Cuzzi	Ditto, ditto.

Case.	Age.	Parity.	Period of pregnancy.	Reasons for induction.	Injections.	Result to Ch.	Result to Moth.	Remarks.	Observer.	Reference.
5	22	I-p.	8 mos.	Albuminuria and systolic murmur at apex	4 injections P. 2 cgr., followed by a 4 p. c. solution P. nitrate on tampon to cervix	A.	R.	Slight pains after 1st injection, none with rest; syringe between uterus and ovum	Nicolini	Annali di Obstet. Milano, i, 1879, p. 95.
6	40	VI-p.	36th week	Hydramnios and (?) dead fœtus	8 injections P. 2 cgr. every ½ hour	A. D.	R.	No effect from P.; artificial rupture of membranes; twins, one macerated	Sandberg	Norsk. Magaz. f. Lägevidensk. Kristiania, ser. iii, Bd. x, Heft 8, p. 624.
7	27	I-p.	6½ mos.	Anasarca, ascites, with albuminuria	10 injections m xv of 2 p. c. sol. P.	?	R.	Slight but evanescent pains after P.; bougie inserted	Dobiowolsky	Medicinsky Westnik., 1879, Nos. 10, 11, 13.
8	26	I-p.	7 mos.	Rachitic pelvis	5 injections of 1 gr., 1·5 gr., 2 gr., 2 p. c. solution of P.	?	R.	Neither subjective nor objective pains; bougie	Felsenreich	Wiener med. Wochen., 1879, No. 29, p. 790.
9	?	II-p.	8 mos.	Forceps 1st child; flat pelvis	5 injections of 2 cgr. P. 3 days' interval, then 2 further injections	D.	R.	Absolutely negative result; deep puncture of membranes; version; difficult extraction	Weiponer	Centralblatt f. Gynäk., 1878, Bd. ii, 339.
10	28	II-p.	7½ mos.	Pelvic deformity	3 injections P. of 2 cgr.	A.	R.	No pains; caoutchouc bag introduced into cervix; very serious symptoms arose	Hyernaux	Bull. Acad. Royal de Méd. de Brux., 1878, tome xii, No. 7.
11	?	II-p.	36th week	Generally contracted pelvis; parametritis and acute paraplegia with 1st labour	4 injections of P. 2 gr., 3 cgr., 3 cgr., and 4 cgr.	D.	R.	Only slightest trace of pains: bougie	Sänger	Archiv f. Gynäk., 1879, Bd. xiv, p. 48.

12	23	III-p.	36th week	1st child perforation; 2nd induction followed by perforation; rachitic pelvis	2 injections P. 2 cgr., 3 cgr., and after rupture of membranes 4 cgr.	A.	R.	No pains; bougie	Sänger	Ditto, p. 50.
13	26	I-p.	32nd week	Slight scoliosis and hydramnios	6 injections P. 2 cgr.	A.	R.	Pains produced with gradually diminishing intensity; catheter placed in cervix for a short time; finally ergot and Pulv. Secalis given	Sänger	Ditto, p. 72.
14	?	I-p.	8 mos.	Great vulval œdema, ascites, and albuminuria	3 injections P. 2 cgr.	A.	R.	No pains although full phenomena appeared; spontaneous labour; ascites increasing	Brünnecke	Berlin med. Wochenschrift., 1880, No. 9.
15	?	III-p.	8½ mos.	General œdema; albuminuria	Injections on 8 days, twice second day, 2 cgr. P.; altogether 18 cgr. injected	Twins ♀	R.	No labour pains, subjective or objective; labour began 2 days after last injection	Kröner	Archiv f. Gynäk., 1880, Bd. xv, p. 102.
16	36	I-p.	7 mos.	Cervical fibromyoma	4 injections, 3 of ♏xij and 1 of ♏xv 2 p. c. solution	D.	D.	No labour pains; insertion of bougie; peritonitis	John Phillips	Present paper.
17	33	IV-p.	8 mos.	Pelvic contraction; version 2nd labour; craniotomy 3rd	3 injections ♏xx of 2 p. c. solution	A.	R.	Bougie inserted; forceps applied	John Phillips	Ditto.

TABLE III.—*Cases in which Pilocarpin or Jaborandi were administered for Puerperal Eclampsia.*

No.	Parity.	Age.	Period of pregnancy.	Urine.	Eclamptic attacks.	Dose of drug.	Labour.	Concomitant treatment, if any.	Result. Ch.	Result. M.	Remarks.	Observer and reference.
1	I-p.	34	8 mos.	Alb. (+)	2 attacks, post-partum only	·03 grms. Pilocarpin Hydrochl. subcutaneously	Natural	Morphia, chloroform, and venesection	D.	R.	P. given after venesection and no attacks followed	Œssinger, Arztl. Mitth. a Baden; Karlsruhe, 1881, xxxv, pp. 129—131.
2	I-p.	32	Term	Alb.	1 attack, with coma, ante- and post-partum	„ „	„	None	A.	R.	No attacks after injection	Mathias, Prak. Artz. Wetzlar, 1881, No. 4, pp. 73—78.
3	I-p.	26	T.	?	Several attacks, with profound coma, ante- and post-partum	„ „	Forceps	Chloroform and cold cloths	?	R.	Attacks occurred after injection	Ditto, ditto.
4	I-p.	22	6—7 mos.	Alb. (+)	Attacks ante- and intra-partum; 2 days' coma, post-partum	mxv of 2 p.c. solution repeated in 7 hours	Natural; ended 10 hrs. after attacks	None	D.	R.	Cessation after 1st injection, but return with labour. After 2nd injection much weaker, but breathing so embarrassed as to threaten life	Hamilton, Brit. Med. Journ., 1881, i, p. 511.
5	I-p.	19	7½ mos.	„	Awoke in convulsions; 8 ante-partum, coma intra-partum, and 4 post-partum	Gr. ¼ P. injected and repeated in 6 hours, full effects post-partum	Version; post-partum hæmorrhage	„	D.	D.	30 hours after delivery bronchial râles, dyspnœa, asphyxia	FordyceBarker, New York Med. Rec., 1879, xv, p. 196.

6	IV-p.	?	T.	Alb. ⅓	3 attacks, 9 hours post-partum	Gr. ½ P. injected, repeated in 6 hours	Natural; 2 hours	Gr. ½ Morphia subcut. before P., followed by 6 hours' sleep	A.	D.	Alarming symptoms after 2nd injection; copious salivation and indications of pulmonary thrombosis	Ditto, ditto.
7	I-p.	?	7 mos.	Alb. ½, urea 1·97 p.c.	Prodroma for 3 weeks; 31 attacks ante-partum; deepening coma	Gr. ½, gr. ½, gr. ½ P. injected on successive days	Came on at full time	Diuretics, digitalis, and purgation before P., all failed	A.	R.	2 fits only at long intervals after 1st injection; increase in amount of urine	Murphy, Amer. Journ. Obs., 1883, xvi, p. 1251.
8	X-p.	38	T. less 7 days	Alb. ½	9 convulsions, and coma ante-partum	Gr. ½ P. every 6 hours.	Labour came on; natural	None	D.	R.	Seen 12 hours after 1st fit; no fits after injection	Ditto, ditto.
9	I-p.	?	T.	„	Coma and attacks intra-partum; coma post-partum; prodroma	2 injections ·02 grms. P., full effects; 5 hours interval	Natural	Usual; none of any avail	?	R.	No attacks after P.; subsequent injections relieved coma	Cantilena, Lo Sperimentale, Oct., 1882.
10	I-p.	24	7 mos.	Alb. (+)	Prodroma; convulsions and coma ante-partum	P. gr. ½, gr. ½, gr. ½ in 36 hours	7 days later, child macerated	Chloroform and icebags before P.	D.	R.	One attack 40 min. after 1st injection, no more, and gradual recovery	Horrocks, Lancet, 1885, vol. i, p. 1079.
11	?-p.	38	8½ mos.	„	Semi-coma, which yielded to treatment, 3 hrs. post-partum; 3 attacks, and subsequent acute mania	P. gr. ½ twice within 2 hours, full effect	Natural at term	$CHCl_3$ and calomel	? ?	R.	No attacks after P., gradual recovery; profuse flow of urine	Thomas, Amer. Journ. Obst., 1879, xii, p. 611.
12	I-p.	14	8 mos.	Alb.	Violent attacks ante-partum; coma	P. gr. ½ acted in 8 min.	Natural in 3 days	Venesection, ʒix Chloral and Pot. Br. per rectum before P.	D.	R.	No convulsions after P.	Whelen, Amer. Journ. Obst., 1880, xiii, p. 143.

No.	Parity.	Age.	Period of pregnancy.	Urine.	Eclamptic attacks.	Dose of drug.	Labour.	Concomitant treatment, if any.	Result. Ch.	Result. M.	Remarks.	Observer and reference.
13	II-p.	30	T.	Alb. (+)	2 attacks ante-partum; several post-partum every ½ hour	P. gr. ¼ injected twice, acted in 6 minutes	Natural	Venesection, ʒxvj after P.	A.	R.	Within 1 hour of injections 3 fits, none after	Whelen, Amer. Journ. Obst., 1880, xiii, p. 143.
14	VII-p.	?	T.	Alb. (+) blood	Anasarca 1 month; attacks intra-partum; coma	P. gr. ¼; copious result	„	Venesection, ʒxvj before P.; Chloral and Sod. Br.	?	R.	No fit after injection	Albert Smith, ditto, p. 145.
15	I-p.	26	8 mos.	Alb. (+) blood	7 attacks ante-partum; 2 more after 1st injection, then 2 others	P. ·02 grms., full effect in 2 min., then ·07 grms.	Natural in 9 days, macerated child	Priessnitz's wet pack and chloral after P.	D.	R.	Albumen disappeared at labour; attacks less severe after P.	Bidder, Centralbl. f. Gynäk., 1878, Bd. ii, p. 337.
16	IV-p.	27	T.	Alb. (+)	9 attacks ante-partum; 15 post-partum	P. ·02 grms. after 8th post-partum, severe effects; again after 10th	Natural	Chloral per rectum after P.	A.	R.	7 attacks after 1st injection; gradually weaker; coma 24 hours	Ditto, ditto.
17	I-p.	23	T. less 8 days	Alb.	Prodroma; 5 ante-partum with coma; 1 during dilating stage	P. ·02 grms. at 5th attack, then before 6th attack	Natural	None	A.	R.	Action of 2nd injection in 5 min.; no further attacks; conscious in 1¼ hours	Prochownick, ditto, p. 269.
18	VI-p.	34	T.	Alb. (−)	1 attack intra-partum; 3 post-partum	P. ·02 grms. after last attack	Natural	$CHCl_3$ failed for retained placenta	A.	R.	Placenta easily delivered after P.; no further fits	Ditto, ditto.
19	I-p.	18	T.	Alb. (+)	8 attacks ante-partum; cyanosis, deep coma, impending asphyxia	P. 02 grms. after 8th attack; again in 5 hrs.	Forceps	Morphia during 7th attack	A.	R.	Artificial resp. 7th attack; no attack after 1st injection P.; 2 hours' sleep	Stroynowski, ditto, p. 480.

20	I-p.	23	31st week	Alb. (+)	Prodroma, several attacks ante-partum, coma, none post-partum	P. ·02 grms. before any fit, twice; then interval of 5 days. P. ·02 grms. after 2nd attack and 10th attack	Induction of labour; bougie; forceps	None	D.	R.	Fœtal heart-sounds inaudible after 4th injection; alb. increased after 2nd; attacks gradually abated	Schramm, ditto, 1879, Bd. iii, p. 313.
21	I-p.	23	?	Alb. ½	Prodroma, 5 attacks; ante-partum coma and amnesia; 1 intra-partum	P. ·02 grms. 3 times after 5 attacks; 9 times after	Os uteri bilaterally divided; twins	„	?	R.	Patient moribund before P.	Ditto, ditto.
22	I-p.	21	T.	?	1 hour post-partum and continued for 24 hours; perfect coma and cyanosis	P. ·03 grms., full effect	Natural	Morphia and chloral before P.	A.	R.	Gradual improvement after P.; no further attacks	Braun, Berl. klin. Wochen., 1879, No. 24.
23	I-p.	19	T.	Alb.	10 attacks intra-partum; 4 post-partum; deep coma	P. ·02 grms. after 4th post-partum attack, suffocative symptoms in 5 minutes	Forceps	Morphia after 1st post-partum attack; venesection 230 grms. after 10th attack	A.	R.	No further attack after P.; ·0006 atropin injected when moribund	Sänger, Archiv f. Gynäk., 1879, Bd. xiv, p. 472.
24	I-p.	19	T.	Alb.	8 attacks ante-partum; 37 post-partum; coma	P. ·02 grms. 10 minutes after 37th attack	Lateral incision of cervix; forceps	None	D.	D. 12 hrs.	Slight bronchial catarrh, became rapidly suffocative after injection	Schütz, quoted by Sänger, ditto, p. 476.
25	?-p	36	6 mos.	Alb. (+)	Continuous attacks and coma ante-partum	P. ·02 grms. injected	Undelivered	Morphia ·03 grms. before P. Chloroform, wet pack, venesection twice	—	D.	Suffocative symptoms in a few minutes	Hinze, quoted by Sänger, ditto, p. 477.

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No.	Parity.	Age.	Period of pregnancy.	Urine.	Eclamptic attacks.	Dose of drug.	Labour.	Concomitant treatment, if any.	Result. Ch.	Result. M.	Remarks.	Observer and reference.
26	IV-p.	39	37 weeks	Alb.	5 attacks ante-partum; none intra-partum; 12 post-partum; coma	P. ·02 grms. after 2nd, 4th, and 6th attack	Natural	Venesection 5—600 grms. after 1st P. injection; chloral after 11th attack	A.	R.	Eclampsia 2nd child, intra-partum; with 3rd child, post-partum; nearly conscious after 10th attack	Sänger, Archiv f. Gynak., 1879, Bd. xiv, p. 85.
27	I-p.	28	8 mos.	Alb.	Ante-partum; semi-coma	P. gr. ⅓ during attacks, copious physiological effect	Natural	Chloral before and after	D.	D.	No effect on attacks	Kirk, Lancet, 1887, ii, p. 307.
28	?-p.	30 to 35	7 mos.	Alb. blood	Ante- and intra-partum; semi-coma; could be roused between attacks	P. gr. ⅓ injected	Natural	None	D. some days	R.	Profuse salivation, no attacks after P.; purpura hæmorrhagica	Ditto, ditto.
29	?	24	T.	Trace	21 hours post-partum; coma	Nitrate of P. gr. ⅓ three times	Natural	Ether during each fit, Chlor. and Pot. Brom. before P.	A.	R.	5 fits after 1st injection, 6 after 2nd, none after 3rd, coma gradually disappeared	Finniss, Brit. Med. Journ., 1887, ii, p. 129.
30	I-p.	22	T.	?	12 attacks post-partum; complete coma 3 days; prodroma	P. gr. ¼ 3 times	Forceps, adherent placenta	Chlor. and Pot. Brom.	A.	R.	No attack after 2nd injection	Squance, Lancet, 1886, ii, p. 1019.
31	VIII-p.	35	T.	None	Attacks intra-partum only	P. gr. ½ by mouth; no effect; repeated twice at 20-minute intervals	Forceps	Chloroform after P., which produced enormous acceleration of pulse, with 2 applications. Chloral and Pot. Brom.	A.	R.	No attacks after P. of any severity	Galabin, Brit. Med. Journ., 1879, ii, p. 729, and personal communication.

[illegible]	I-p.	[illegible]	7½ mos.	Anuria and uræmia	10 attacks during 12 days' prodroma, ante- and intra-partum; coma	Fl. extr. Jab. ℥ss with chloral in enema; 1 hour later ♏xv subcutaneously twice in ½ hour	„	Calomel and Pot. Brom. without effect	D.	D.	Profuse salivation after injections; asphyxia; comatose	Mather, New York Med. Rec., 1879, xvi, p. 307.
33	I-p.	?	7 mos.	Anuria then alb.	Many attacks, with subsequent coma ante-partum	Fl. extr. Jab. gr. xij in 2 enemas	„	Venesection; chloroform	D.	R.	No attack after Jab., and no albumen a few hours after	Boislinière, St. Louis Med. Rec., 1879, v, p. 233.
34	I-p.	21	„	Alb.	1 attack intra-partum, many post-partum	Fl. extr. Jab. ♏xv by mouth every 15—30 minutes up to gr. viij, then subcutaneously up to gr. iv	Induction of labour; forceps	Chloroform before Jab.	A.	R.	On cessation of chloroform attack returned; disappeared after 2 injections Jab.	Hunt, Proc. Med. Soc., King's County, 1878, iv, p. 83.
35	VIII-p.	?	T.	Alb., 2 dys. p.-p.	5 attacks, with 5 hours' coma post-partum	Fl. extr. Jab. ℥j; copious effect	26 hrs.; forceps	Opium for after-pains 3 doses (?)	A.	D.	10 hours after Jab. death from cerebral œdema and cardiac asthenia	Fordyce Barker, New York Med. Rec., 1879, xv, 196.
36	I-p.	36	7 mos.	Alb.	Prodroma 1 mo.; 6 attacks ante-partum, 1 two hours post-partum	Fl. extr. Jab. ℥j twice with 4 hours' interval; full effect	Labour induced; Barnes' bags; version	None	?	D.	Jab. was being given for albumen before attacks; death from pulmonary œdema	Ditto, ditto.
37	I-p.	22	6½ mos.	Alb. (+)	Prodroma; 5 attacks ante-partum in 48 hours, attack lasting 3 hours post-partum	Fl. extr. Jab. ♏xv subcut. twice; good effect in 20 minutes	4 hours; natural	Oxalate of Cerium; Digitalis; cupping over kidneys	D.	R.	Jab. injected after 3rd attack; beneficial effect	Everett Warner, New York Med. Rec., 1879, xvi, 196.
38	I-p.	26	8 mos.	„	Prodroma 6 wks.; 6 attacks in 6 hours, and many others ante-partum; severe attack post-partum	Inf. Jab. 5 p. c. by mouth post-partum	Bougie; induction of labour	2 venesections, 500 grm. each, after 6th attack; wet pack	D.	R.	Moribund before Jab., which produced copious sweat; no further attacks	Fehling. Centralbl. f. Gynäk., 1878, Bd. ii, 196.
39	I-p.	23	T.	„	2 attacks intra-partum; 4 post-partum	Inf. Jab. after last attack; copious effect	Lateral incisions; forceps	Chloroform before Jab.	?	R.	No attacks after Jab.; suppurative parametritis	Ditto, ditto.

The use of pilocarpine may be conveniently considered under five headings:

1. As an abortive.
2. For the induction of premature labour.
3. Intra-partum.
4. Post-partum, and during the puerperium.
5. In albuminuria, with or without eclampsia.

1. Two difficulties meet us under this class: (α) the rarity of occurrence of cases in which the procuration of abortion is necessary, (β) the inability to eliminate the constitutional tendency, which may or may not exist, to abort. The three cases related amply prove both. Chadzynski* administered pilocarpine to a syphilitic girl in her fourth month of pregnancy; he was, however, unaware of her condition. After the ninth injection labour pains came on, and a fœtus was expelled. In Schauta's case† the patient was aborting at about the fifth week; the hæmorrhage was very severe, and the ovum was still fixed in the uterine cavity, in spite of manual attempts at its removal. One injection of pilocarpine into the forearm produced expulsion of the product of conception into the vagina. In order to induce abortion for eclampsia and albuminuria Pasquali‡ made a single injection. No fresh attack occurred, but the salivation was so abundant that the comatose patient was almost suffocated. Two days afterwards abortion took place. These cases are somewhat unsatisfactory; in the first and third we have syphilis and albuminuria as reasons for the procedure, while, as is well known, both these conditions (particularly the former) are fertile sources of spontaneous abortion. The second case, however, has a bearing on the value of pilocarpine in uterine spasm, to which I purpose referring later on.

2. *For the induction of premature labour.*—I have collected twenty-seven cases where sufficiently full details have been

* "Przglad Lekarski," 1878, No. 25; quoted in 'Med. Record,' London, 1878, p. 526.

† 'Wien. med. Wochensch.,' 1878, No. 47.

‡ 'Atti Accad. Med. di Roma,' 1879, v, pp. 61—80.

given in which pilocarpine was administered subcutaneously with this object, which, with the two of my own immediately to be related, make twenty-nine. The drug was used either in the form of hydrochlorate (twenty-eight times) or the nitrate (once).

CASE 1.—The patient, aged 36, was a primipara, and at the end of the seventh month of pregnancy. There were (in addition) three uterine fibromyomata,—a large one at the fundus and to the right extending up to the lower border of the liver, a smaller one on the anterior uterine surface, and a third in the cervix occupying the anterior and lateral portions of the inlet of the pelvis. It was owing to the position of this last that induction of labour was determined upon. It seemed a fitting case for as little manipulation as possible. Four injections of pilocarpine (2 per cent. solution) were given, with an absolutely negative result so far as labour pains were concerned.

Date, 1887.	I. August 2nd.	II. August 3rd.	III. August 3rd.	IV. August 4th.
Amount and time of injection	mxij of 2 per cent. solution; 3 p.m.	mxij of 2 per cent. solution; 10.30 a.m.	mxij of 2 per cent. solution; 4.45 p.m.	mxv of 2 per cent. solution; 11.50 a.m.
Pulse — Before injection...	82	84	80	90
Pulse — 1½ hours after ...	114	118	124	120
Pulse — 5½ hours after ...	108	106	92	94
Sweat on forehead — Appeared...	3.30 p.m.	10.35 a.m.	None	12 noon.
Sweat on forehead — Disappeared	4 p.m.	11.15 a.m.	—	12.15 p.m.
General sweat — Appeared...	3.35 p.m.	10.35 a.m.	None	12 p.m.
General sweat — Disappeared	5.20 p.m.	11.50 a.m.	—	1.20 p.m.
Salivation — Began.....	Very copious, 3.35 p.m.	Copious, 10.40 a.m.	None	Slight, 11.55 a.m.
Salivation — Ceased ...	4.35 p.m.	11.50 a.m.	—	12.20 p.m.
Vomiting	Once, 4.10 p.m.	None	None	Once, 12.7 p.m.
Facial flush — Appeared	4 p.m.	10.35 a.m.	„	12.5 p.m.
Facial flush — Disappeared .	4.45 p.m.	11.25 a.m.	—	12.40 p.m.
Acme of thirst	3.55 p.m.	11 a.m.	None	12.10 p.m.
Pupils — Dilated	4 p.m.	11.5 a.m.	Normal	12.30 p.m.
Pupils — Contracted ...	5.30 p.m.	12.15 a.m.	—	2 p.m.
Pains	Throbbing in lower part of abdomen, but no true labour pains	No pains	None	Pains like labour pains, left side at 12·5 p.m.

Date, 1887.	I. August 2nd.	II. August 3rd.	III. August 3rd.	IV. August 4th.
Fœtal movements	Very much increased after 3.15 p.m.	Very much increased 10.50 a.m.	Slightly increased	Much increased at 12.5 p.m.
State of genital passages	Copious mucous discharge; no blood; os uteri as before	Much mucous discharge; no blood	No discharge; os uteri admits the tip of first finger more easily	No change
Fœtal heart-sounds ...	Inaudible	Inaudible	Inaudible	Inaudible.

It will be seen that the effect of pilocarpine is somewhat lost by repetition, but that by increasing the dose a renewal may be produced.

The urine was scanty, high coloured, and deposited a considerable amount of lithates on standing; sp. gr. 1030. The temperature was not raised more than three fifths of a degree all through the experiments. Labour was ultimately induced by means of a catheter. The patient was delivered naturally of a stillborn male infant, and died on the eighth day of acute peritonitis commencing over the large fundal tumour.

Case 2.—The patient, aged 33 years and a 4-para, was eight months pregnant. The three previous children were stillborn. The first labour terminated after fifty-six hours, naturally; pelvic contraction in the antero-posterior diameter was discovered; version was performed at the second labour, while at the third perforation was necessary after attempted reposition for a forehead presentation and head jammed in the pelvis.

October 3rd, 1887.—10 a.m.: I made the first injection into the right buttock of 20 minims of a 2 per cent. solution of pilocarpine hydrochlorate. All the usual intoxication phenomena followed as in Case 1, and in addition considerable vesical pain. The sweat and salivation were not

copious or in any way distressing. No labour pains; no increase in fœtal movements. 9 p.m.: Second injection. The sweat and salivation as before. The fœtal movements markedly increased both objectively and subjectively. No labour pains.

4th.—10.30 a.m.: Third injection. All the intoxication phenomena occurred, but less marked. No labour pains ensued.

5th.—I introduced a catheter. Labour came on in eight hours' time, and delivery of a living child was effected by forceps.

As will be seen from Table I, the successes recorded amount to twelve only in number, while the failures (seventeen) will be found in Table II.

The cause present for induction of labour was in seventeen cases simply pelvic deformity, and consequent antecedent difficulty with previous labours, necessitating perforation, version, or forceps. In four cases, in addition to the pelvic contraction, there were other complications, viz. vesico-vaginal fistula (Table I, 7), hydramnios (Table II, 13), previous cellulitis with rectal abscess (Table I, 10), and previous parametritis with paraplegia (Table II, 11). In four cases albuminuria and œdema were the cause, while albuminuria with an apical systolic murmur (Table II, 5), epilepsy with pernicious anæmia (Table II, 4), hydramnios (Table II, 6), and uterine fibromyomata furnished the reasons for the operation in the remaining four cases.

On further examining the list of supposed successes, it will be found that in five only can the result be said to be without the slightest doubt (Schauta, Haylen, Pasquali, Sänger, and Schäbel). Massmann's two cases (Table I, 5, 6) are both open to question. In albuminuric women premature rupture of the membranes is not at all uncommon, and although the amniotic fluid in both came away after the first injection (in the first case some hours subsequently, and in the second after five hours), yet in neither of them did the labour pains begin until this

phenomenon occurred. In the first case reported by Kleinwächter (Table I, 7) the patient was afflicted with a vesico-vaginal fistula. An attempt was made to pass a bougie into the cervix, but failed owing to the large amount of cicatricial tissue. It must be borne in mind that premature labour is very liable to come on when pregnancy is complicated with vesico-vaginal fistula. Cohnstein* mentions fourteen such cases, and premature labour took place no less than six times. In Kleinwächter's second case (Table I, 8) four injections were given, and very slight labour pains followed the third only, and it was not until more than twenty-four hours had elapsed, and after walking, that labour began. He thinks that the drug may possess an accumulative effect, and that in both the pains were so intense that both fœtuses were killed. Six observers have reported nineteen additional unsuccessful cases as follows :

Weiss	8	Hot Douches and Pilocarpin to bring about Labour. Dissertation, Berlin, 1880.
P. Müller...	4	Verhandlung der physik-med. Gesellsch. zu Würzburg, Bd. xiv, Hefte 1 and 2 (1 Table).
Nowitzky...	2	St. Petersburg. med. Wochen., 1880, v, pp. 199, 207.
Köster	1	Berlin. klin. Wochenschr., 1879, No. 46, p. 686.
Welponer...	3	Wiener med. Wochen., 1878, No. 44.
Parisi	1	Gazetta medicale, italiana prov. Ven., 1873, No. 34.

Hence out of a total of forty-eight cases, five only, or 10·4 per cent., can be considered as successes without question. From these facts it would appear that pilocarpine is able in a certain number of cases to induce labour, but that it is not in any way reliable as an ecbolic.

Its effect seems more likely to be produced in those cases where pregnancy would otherwise be liable to a premature termination. I think that in all cases where manipulations are to be avoided, as in uterine fibromyomata, or with extreme sensitiveness to vaginal examination, it should be given a trial before other means are resorted to.

The maternal deaths amounted to two only, neither of

* 'Berlin. klinisch. Wochensch.,' 1878, No. 20.

which could in any way be attributed to the drug. Out of thirty-one children, eighteen were born alive, seven still-born, and there are six whose fate was not mentioned. The mortality among twenty-five children is therefore 28 per cent. Let us compare this result with the statistics obtained from induction by other means. Litzmann,* who is notoriously unfavourable to this operation in pelvic deformity, records the result of 373 cases. In 339 the labour was not interfered with and took place at term, with result of a maternal mortality of 6·9 per cent., and a fœtal mortality of 20·3 per cent. In thirty-four, induction of labour was brought about with the appalling mortality of 14·7 per cent. among the mothers, and 55·8 per cent. among the children. Spiegelberg† finds the fœtal mortality of full-term labour in contracted pelvis 28 per cent., while it rises to 66 per cent. in cases of induction of premature labour. These, I believe, are on all sides admitted as much too high, but allowing a very broad margin, the fœtal mortality in cases where pilocarpine has been administered contrasts most favourably with the results just given, and at once does away with the idea with the idea that this drug has a baneful influence on fœtal life.

The first part of Case 4 may be considered as an additional failure to induce labour at the eighth month for pelvic deformity, but it has not been included in the foregoing list.

3. *Intra-partum.*—Under this heading pilocarpine may be administered in three different stages, although the first is rather difficult of definition:

(α) During the "latent period" of labour.
(β) During the dilating stage of labour.
(γ) During the expulsive stage of labour.

(α) By this I allude to the time roughly included between the 260th and 280th day, when the cervix will

* 'Archiv für Gynäkol.,' 1870, Bd. ii, p. 194, "Ueber den Werth der Künstlich., &c."

† Ibid., Bd. i, p. 1.

be found to be more or less obliterated and the uterine body sunk low in the pelvis. The observations of Braxton Hicks* make it quite certain that the pregnant uterus is in a constant state of alternate relaxation and contraction, which is a painless condition. Labour pains differ from these *only in degree,* and hence anything stimulating these latter would not be an *originator* of labour pains, but only a *strengthener* or *intensifier* of them. If pilocarpine has this power, it may be properly termed a *labour-pain stimulating and augmenting remedy,* and as a result will be able, under certain conditions, to convert imperceptible and painless uterine contractions into true or painful labour pains. Krönert defines this period as the "immediately imminent beginning of birth" (unmittelbar bevorstehenden Geburtsbeginne). He denies that pilocarpine has any power in this condition, and gives three cases in which it was evidently useless. Sängert on the other hand states the exact opposite, and gives two successful cases in detail.

I think the difficulty of fixing the limits of this stage so great that this apparent discrepancy is easily accounted for, and an incident which occurred in the course of these researches somewhat justifies the statement.

CASE.—A 8-para, aged 31, and whom I had selected for this reason, viz. that she assured me she could always tell the exact date of fruitful intercourse, was according to her own calculation within fourteen days of her confinement. On examination, I found the uterus low down in the pelvis, while the os uteri just admitted the tip of the examining finger; the lips were not yet thinned out. Rhythmic uterine contractions were tolerably easy to be made out, and the next day I purposed using the pilocarpine. In the night, however, labour began and terminated in eight hours; had I injected the drug, I should naturally have

* 'Trans. Obstet. Soc. London,' vol. xiii, p. 216.

† 'Archiv für Gynäk.,' 1880, Bd. xv, p. 97.

‡ Ibid., 1879, Bd. xiv, p. 43, *et seq.*

attributed the result to its influence. In consequence of this fact I felt that any further experiment would scarcely tend to solve the matter at issue.

(β) Should a few isolated or irregular pains have occurred, pilocarpine appears able to convert the intermittent irregularity into a continuous series; moreover, if labour is fairly started, the labour pains become more efficacious and their time of appearance more regular. Sänger is again a strong advocate of this theory, while Kröner is as much opposed to it. My own two cases (3 and 4) certainly quite confirm the former observer.

CASE 3.—The patient, aged 35, was at full term with her fifth pregnancy. All the previous labours had been at term, normal in character and followed by easy convalescence. During the last three months she had had continued but slight hæmorrhage, small black clots passing daily.

September 11th, 1887.—She was admitted into the hospital, having felt as though she were going to commence labour; slight hæmorrhage was going on when I saw her, but of a bright colour.

After being in the hospital eighteen hours, and the hæmorrhage still continuing, it was thought necessary to interfere. On examination, the os uteri was the size of a five-shilling piece, thick and fleshy. A vertex was made out with some difficulty as it was very high up; anteriorly a boggy mass was detected (? placenta).

At 10.40 p.m.: Fœtal pulse 148, regular and loud; heard best in the right hypogastrium. Maternal pulse 76, full and regular. Pupils normal. Fœtal movements had been scarcely felt for some days, but on palpation they were detected above the navel. Twenty minims of a 2 per cent. solution of pilocarpine hydrochlorate were injected into the right buttock.

10.45 p.m.: General feeling of warmth. Salivation commencing and small beads of perspiration round the lower eyelids and sides of the nose. Maternal pulse 108, full and regular. Fœtal pulse had risen to 156.

TABLE IV.—*A Record of the Maternal and Fœtal Pulse Rate observed in three instances after Injection.*

No. of case and injection.	Maternal pulse.		Time.	Fœtal pulse.		Minutes after injection at which observation was taken.
	Before.	After.		Before.	After.	
Case III.	76	—	10.40 p.m.	148	—	—
Injection at 10.40 p.m.	—	108	10.45	—	156	5minutes
	—	98	10.50	—	?	10 „
	—	90	11.5	—	162	25 „
Membranes burst 11.30.	—	96	11.35	—	162	55 „
Case IV.	89	—	2.20 p.m.	121	—	—
1st injection, Jan. 13th, at	—	96	2.55	—	130	10 minutes
2.45 p.m.	—	114	3.5	—	132	20 „
	—	110	3.20	—	130	35 „
	—	112	3.40	—	138	55 „
Bag of waters intact.	—	98	4.30	—	126	1 hr. 45 min.
Case IV.	99	—	3.10 p.m.	132	—	—
2nd injection, Jan. 14th, at	—	108	3.21	—	130	11 minutes
3.15 p.m.	—	108	3.34	—	142	24 „
	—	118	4.1	—	?	51 „
Membranes ruptured 6.30 a.m.	—	108	4.18	—	131	68 „
Sänger, 1st case . . .	72	90	—	122	140	
„ 2nd „ . . .	66	78	—	156	120	
Cuzzi	84	96	—	140	146	

10.50 p.m.: Salivation well marked, but not copious; pupils fully dilated, general moisture of skin; facial flush. Maternal pulse 98.

11 p.m.: Nausea, salivation, and sweating continuing; slight mucous *râle* on coughing.

11.50 p.m., or twenty-five minutes after injection: *First labour pain* in the back, of eight seconds' duration. Nausea ceased, no salivation, but sweat still going on. Maternal pulse 90, fœtal pulse 162, feebler, intermitting twice in the minute.

11.12 p.m.: Second labour pain, of ten seconds' duration.

11.15 p.m.: Third pain. Uterus could be felt hardening and increasing in hardness up to the acme of the pain; duration fifteen seconds.

11.18 p.m.: Fourth pain, strong and continuous, *lasting one minute fifteen seconds;* membranes bulging, lips of cervix thinner.

11.22 p.m.: Fifth pain, of fourteen seconds' duration. Maternal pulse 94, fœtal 160; a *caput succedaneum* is distinctly forming; the head, however, does not advance. An occipito-posterior presentation diagnosed.

11.27 p.m.: Sixth pain, ten seconds, strong fœtal movements noticed, both subjectively and objectively.

11.30 p.m.: Seventh pain, thirty seconds' duration, very powerful; the waters burst, but there is no descent of head.

11.35 p.m.: Eighth pain, fourteen seconds in length. Maternal pulse 96, fœtal 162, muffled in character, but regular. All the pilocarpine symptoms have quite disappeared. Os uteri is now the size of a claret-glass rim.

Further pains occurred at 11.42, 11.47, 11.55, and 11.59 p.m., averaging from ten to fifteen seconds in length; fourteen pains had passed in less than sixty minutes, or about 1 in 4.

12th.—12.10 a.m.: Pain. Pulse 84, fœtal pulse 148. Caput succedaneum large, but head not descending. Pains occurred at 12.14, 12.35, 12.42, 12.55, and 2.15 a.m., or 6 in sixty minutes = 1 in 10. She then slept for three

hours, all pains having ceased, but dilatation of the os uteri complete.

Termination of labour.—The patient was kept quiet all day, lukewarm douches of carbolic lotion (1 in 60) were given, and she was carefully fed. At 8 p.m. hæmorrhage began again. Chloroform was accordingly given, and the forceps applied. Delivery was difficult owing to the occipito-posterior presentation. The child was alive, and there was no difficulty with the placenta. The mother made a good recovery.

The success of the drug in this case seems beyond doubt. Pains came on twenty-five minutes after injection of the pilocarpine, and, as its effects wore off, gradually died away, but not until complete dilatation of the os uteri had taken place.

In the next case I had the advantage of the assistance of my friend and colleague Dr. M. Handfield-Jones, who kindly took several sphygmographic tracings, both before and during the action of the pilocarpine. Of these five have been selected as indicative of the progress of its action.

Case 4.—A. C—, aged 43, the mother of ten children, of whom three only are alive, was first seen by me in her eighth labour. I found a prolapsed funis and face presenting. After attempted forceps and version, craniotomy through the left orbit was found necessary. After delivery, a distinct projection of the promontory of the sacrum was found, narrowing the antero-posterior diameter of the inlet. I terminated her ninth pregnancy at seven months by the induction of premature labour. A living child was born after twenty-two hours' labour, which survived nine days. Of her eight previous children only four were at term. She is usually four or five days in labour.

In September, 1886, she went to full time, contrary to my advice, and was only delivered of a stillborn child after a difficult version. Induction of premature labour at the eighth month was determined on, should she again become pregnant.

January 13th, 1888.—She is now at the end of the eighth month of pregnancy.

2.30 p.m.: *Present condition.*—Cervix low down, os uteri externum patent, length of cervical canal three quarters of an inch, internal os uteri admits with difficulty the tip of the forefinger; a vertex presentation can be made out in the anterior fornix, the pelvic deformity unchanged.

Maternal pulse 89, full and regular; fœtal pulse 121, distinctly heard in right hypogastrium. I determined to attempt induction of labour by means of pilocarpine; before this, however, the sphygmographic tracing below was taken.

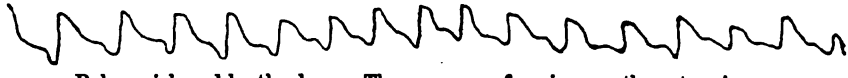
(A.)

Pulse a little quickened and excited by emotion.

2.45 p.m.: Eighteen minims of 2 per cent. solution of pilocarpine injected into left buttock.

2.55 p.m.: Maternal pulse 96, fœtal 130, heard most distinctly between umbilicus and symphysis; general feeling of warmth, slight nausea and salivation; eyes bright and pupils dilated, restless.

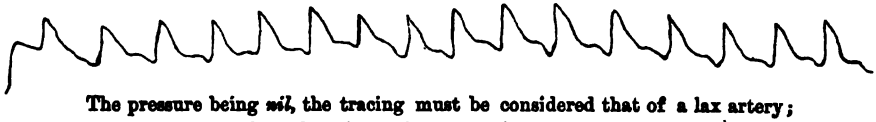
(B.)



Pulse quickened by the drug. The pressure of spring on the artery is now too great (even although lowered to 20), hence the wave "summits" are inclined to be flat.

3.5 p.m.: Sweat general; nausea, however, less. Maternal pulse 114, fœtal 132, weaker, but quite regular; heard most distinctly in right hypochondrium.

(C.)



The pressure being *nil*, the tracing must be considered that of a lax artery; the pulse, although quick, is quite regular.

3.20 p.m.: Sweat ceasing and salivation less; does not complain of any discomfort. Fœtal movements have been very strong all day. Maternal pulse 110, fœtal 130. A tracing taken showed nothing materially different to the previous one (C).

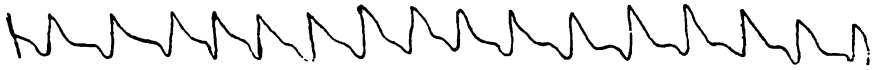
3.35 p.m.: Sweat almost ceased; no sickness or salivation. Pulse 112 and 138.

(D.)

Here the heart's propulsive power appears considerably weakened; pulse slightly irregular.

3.45 p.m.: The fifth and last sphygmographic tracing was taken, to test the length of time pilocarpine continues acting.

(E.)



The heart's power is evidently recovering, but the arterial wall still remains relaxed.

4.10 p.m., or one hour twenty-five minutes after injection, four distinct but slight labour pains occurred with intervals of seven, thirteen, and nine minutes.

4.50 p.m.: All effects have apparently passed off. Maternal pulse 98, fœtal 126, regular, but rather muffled; heard best in right hypogastrium.

Per vaginam.—The parts seem somewhat softer, and there is a certain amount of leucorrhœal discharge, but no change has occurred in the condition of the os uteri. Pilocarpine here failed to induce labour, and, with the exception of the above-mentioned pains, no further uterine action occurred.

9.15 p.m.: Maternal pulse 79, fœtal pulse at three different observations, 108, 118, 116; os uteri as before. I introduced a gum elastic catheter into the uterine cavity.

14th.—6 a.m., or eight hours and three quarters afterwards, some slight hæmorrhagic discharge occurred.

6.30 a.m.: Three slight pains during past half hour. Waters burst. Catheter removed.

2.15 p.m.: Maternal pulse 98, fœtal 130, regular and loud; most audible in right hypogastrium.

3.15 p.m.: Four pains of slight character have occurred during the past hour, or one in fifteen minutes. No apparent increase occurring I injected eighteen minims of a 2 per cent. pilocarpine solution into right buttock.

3.21 p.m.: Considerable salivation and feeling of nausea.

3.29 p.m.: *First sharp labour pain* fourteen minutes after injection. Maternal pulse 108, fœtal 130. Copious diaphoresis and salivation; well-marked facial flush; sick once.

3.34 p.m.: Maternal pulse 108, fœtal 142. Pupils dilated; sweat less.

3.40 p.m.: Second labour pain. On cessation she got up and walked about, but soon felt giddy and faint. This might have been due to the condition of the pupils. Maternal pulse 118, irregular.

Pains now occurred at 3.47, 3.50, 3.53, 3.55, 3.58, 4.1, 4.8, 4.12, 4.15, 4.17, 4.18, 4.21, 4.24, 4.25, and 4.30, or seventeen in one hour = one in three and a half minutes. Os uteri internum was dilated to the size of a shilling, and the cervix thinning.

5.30 p.m.: During the past hour twenty labour pains have passed, or one in three minutes; they have been sharp and long. The os uteri almost fully dilated; the head is now in mid-pelvic position.

6.55 p.m.: Fifteen strong pains have occurred, and labour terminated naturally, the child alive and crying strongly. There was no difficulty with the placenta. The patient made an easy recovery.

Labour here lasted at the longest calculation twelve hours, and though pains only appeared with any regularity for three and a half hours, they proved sufficient to effect the delivery. Let us compare this with her last induction at seven months, where she was twenty-two hours in labour.

Although the membranes had been ruptured twelve hours, and pilocarpine had been administered once before, and again afterwards, still no accident happened to either mother or child.

If we consider the longitudinal and circular muscular systems of the uterus as antagonistic and equally balanced in their action upon each other, pilocarpine seems, by paralysing or relaxing the latter, to irritate the former, and put them into action.

γ. During the expulsive stage the motorial nerve apparatus of the uterus reacts very strongly to stimulants. Pilocarpine will be found to increase considerably the power and efficacy of labour pains occurring during this period, and although it produces these powerful expulsive pains, it does so without exciting tetanic contractions. Provided, therefore, that the head and the pelvis stand in proper relation to each other, its exhibition is always followed by the best results. Sänger is even of opinion that it may replace the forceps, but this seems to me to be rather too sanguine a view.

In the ensuing Table I have collected thirty-nine cases in which the drug was given in either the first or second stage of labour. It shows the very large percentage of successes by this mode of treatment.

I will now detail the three successful cases met with during the expulsive stage.

Case 5.—The patient, aged 21, a primipara, was at her full term of pregnancy; fifteen years before she had had variola, and was severely marked in consequence.

September 12th, 1887, 3 a.m.: Labour commenced, and at 12 noon the os uteri was fully dilated. From this time the pains appeared to abate in both frequency and power, so that up to 3 p.m. only nine pains had occurred, or one in twenty minutes. From 3 to 4.30 p.m. only two were noted, or one in forty-five minutes.

At 4.30 p.m. maternal pulse 68, fœtal pulse 128, loud and quite regular. Temperature normal. Injected fifteen

Observer.	Dilating stage.		? Result.	Expulsive stage.		Reference.
	Suc.	Fail.		Suc.	Fail.	
Bergesio Libero	—	—	1	—	1	Annali di Obstet., 1879, p. 99.
Hinze	—	—	—	2	—	Deutsche med. Wochen., 1879, No. 37.
Brünnecke	—	1	—	—	3	Berlin. med. Wochen., 1880, No. 9.
Valenta	—	—	—	—	1	Memorabilien, Jan. 26th, 1880.
Schauta	4	—	—	9	—	Wien. med. Wochen., 1878, Nos. 47—50.
Sänger.....	3	—	—	3	—	Archiv für Gynäk., 1879, xiv, p. 43.
Kröner	—	—	—	—	4	Ibid., 1880, xv, p. 93.
Pasquali	—	1	—	—	—	Atti Accad. med. di Roma, 1879, v, p. 61.
Schlossberger ...	—	—	—	2	—	Inaug. Diss.: Pilocarpin as a Labour-pain exciting and stimulating remedy, Tübingen, 1879.
John Phillips ...	2	—	—	3	—	Present paper.
Total	9	2	(1)	19	9	

minims of a 2 per cent. solution of pilocarpine hydrochlorate.

4.35 p.m.: Salivation began and continued for the space of an hour and a half, about four ounces of saliva being ejected into a basin by her side; general feeling of warmth.

4.45: Perspiration on upper lip, nose, and lower eyelids. Copious vaginal discharge. Maternal pulse 82, fœtal 136.

4.50, and twenty minutes after injection: *First expulsive labour pain.*

The pains now continued regularly and with increasing intensity at 4.55, 4.57, 5, 5.4, 5.10, 5.17, 5,23, 5.28, 5.33, and 5.45, or eleven pains in less than an hour = 1 in 5½ minutes.

5.55: The membranes, which had so far remained unruptured, broke, and labour terminated rapidly at 7.42 by the birth of a 7½ lbs. child. There was no perineal laceration, the placenta came away in eighteen minutes, and no post-partum hæmorrhage occurred. Here the pains were

so rapid and continuous that there was no opportunity of observing the fœtal heart-sounds.

Case 6.—A lady aged 35, a 6-para, with a capacious pelvis and dilatable soft parts. There had been no difficulty at any of her previous confinements. The first stage of labour had passed off in four hours, and the expulsive pains, after lasting one hour and forty minutes, had gradually disappeared; the head was on the perineum, but had not stretched it. This uterine inertia having continued for nearly five hours, and the husband objecting to the use of chloroform and the forceps, I determined to try pilocarpine, having carefully informed the patient of its probable effects and doubtful efficacy.

At 5.40 a.m. I injected fifteen minims of a 2 per cent. solution into the right buttock.

5.55: Slight sweat, feeling of warmth, and a tendency to salivation.

6.3 a.m.: *First labour pain*, slight, but expulsive in character.

6.7 a.m.: Second pain, more intense, and lasting eleven seconds. Pains now appeared with great regularity and intensity at 6.12, 6.20, 6.23, 6.27, 6.40, and 6.45 a.m. The vulval orifice was half dilated at the acme of the last pain.

Eight pains had thus occurred in forty-five minutes, or about one in six. Now followed five rapid pains, and the head was born, the child being alive. *Expressio placentæ* in twenty minutes. No post-partum hæmorrhage. Puerperium normal.

Case 7.—The patient was a 2-para, aged 23, and was admitted into the hospital at term, after having been six hours in labour. On examination, the head was felt in mid-pelvis, and all the parts well dilated. No labour pains appeared for two hours thirty-five minutes after admission. I therefore thought this a good case for trial of pilocarpine.

January 9th, 1888, 12 noon.—Maternal pulse 90. Injected eighteen minims of 2 per cent. solution into the right buttock.

12.15 p.m.: Sweat, salivation, and general feeling of warmth, pupils dilating, eyes brilliant. Pulse 102.

12.35 p.m.: *First labour pain,* short, but decidedly bearing down in character.

12.39 p.m.: Second pain. These now occurred regularly at 12.43, 12.49, 12.57, 1.7, 1.15, 1.19, 1.22, 1.25, 1.27, 1.29, 1.33, 1.34, 1.37, and with this last pain the head was born. Fifteen pains had occurred in slightly over the hour, or nearly one in four minutes. Puerperium normal.

I think this case is without any doubt. The appearance of the first pain, thirty-five minutes after injection, could not well have been a coincidence; at the same time the pilocarpine might have started the uterine pains and then the pressure of the head on the perineum might have produced additional reflex stimulation.

Remarks.—Here were three cases of uterine inertia, and therefore fit ones for the action of the drug; the doses given were fifteen, fifteen, and eighteen minims; full effects were produced in all three, pains following in twenty, twenty-three, and thirty-five minutes, their average recurrence being one in five and a half, one in six, and one in four. It will have been seen that no difficulty was experienced with the placenta, and no post-partum hæmorrhage occurred in any case. Case 6 was particularly gratifying, as the result was as unexpected as it was decisive, and the accompanying discomforts sometimes found with pilocarpine were very slightly marked.

4. It is to Felsenreich* that we owe our knowledge of the value of pilocarpine post-partum and in the puerperium. He applied the remedy in nine cases with atony of the uterus during the lying-in condition. The attempts were made on the third, fourth, and fifth days post-partum, upon one primipara, two 2-paræ, five 3-paræ, and one 4-para. Twenty drops of a 2 per cent. solution were injected subcutaneously. In only three cases were any positive results shown as regards the uterine contraction. One woman

* 'Wiener med. Wochenschrift,' 1878, No. 22.

stated that she had distinct labour pains, with an increased flow of lochia. The pains came on ten minutes after injection. He thinks that as a post-partum hæmostatic remedy pilocarpine is quite useless. Kleinwächter* entirely concurs, while Sänger was so convinced of the truth of this statement that he expressly states that he made no experiments on the subject. On the other hand, Schauta attributes the rapid involution observed in the thirteen cases he administered it, entirely to pilocarpine.

Prochownick† relates a case which shows its value in post-partum tetany of the uterus. An eclamptic woman, recently delivered of a living child, became unconscious. Tetanic uterine contraction ensued, and all attempts at removal of the placenta failed, even when complete anæsthesia was produced. Twenty-five minutes after the injection there was copious sweat, accompanied by uterine relaxation, the placenta was easily removed, and consciousness returned in three hours.

I have noticed in four cases where I injected pilocarpine that immediately after birth and *expressio placentæ*, there was more "gush" than is usual, but not sufficient to call for any treatment; indeed, it is questionable whether this phenomenon would not have occurred without its administration. Sänger experimented upon a patient with the scorbutic diathesis; severe hæmorrhage occurred, necessitating vinegar injections.

It will be convenient, before drawing any conclusion from the cases related and collected, to inquire into the physiological effects of pilocarpine on mother and fœtus.

What are the results of the injection of a normal amount, say fifteen to twenty minims of a 2 per cent. solution? Empirically they can be divided into three: 1. Secretory; 2. Vascular; 3. Contractile.

1. The secretory are well known, and the sweat and salivation phenomena need not be further mentioned. Experiments on animals prove that there is an enormous

* 'Wiener med. Press.,' 1879, Nos. 13, 15, 17.

† 'Centralblatt f. Gynäk., 1878, Bd. ii, p. 269.

secretion from all the glands of the intestinal canal, and clinical experience shows us that the genital passages become softer and moist, and a copious mucous vaginal discharge is produced, but not necessarily blood tinged. On the day of administration, the quantity of urine falls considerably below the normal standard, the reduction taking place not only in urinary water, but in the urea, uric acid, and chlorides. The next day a corresponding excess is found in all these.

2. Pilocarpine appears to paralyse the vascular centres, whereby arterial congestion is produced. From sphygmographic tracings taken before and during the operation of the drug, it is found that there is a marked lowering of the systemic blood pressure, owing to a relaxation of the arterioles. The pulse usually quickens from fifteen to thirty beats per minute. Dilatation of the pupils occurs in varying times, followed by contraction.

Leyden thinks that the effects of pilocarpine are due to the action of the drug upon the vaso-motor nerves of the peripheral vessels, or to stimulation of the inhibitory nerves of tonicity.* Scotti, who first studied its action on the uterus, attributed its effects to a relaxation of arterial tension. He found that in patients whose menstruation was quite regular, and to whom pilocarpine was given at stated intervals ("Pilocarpin-cur"), the catamenia appeared two days before their time. Under these circumstances pilocarpine will, soon after injection, and according to its general effect on the arterial system, produce in any uterus a condition of hyperæmia more or less marked.

3. The question is now much debated whether pilocarpine has the power of producing true contraction of plain muscular fibre. Popow and von Ohms agree that in animals it produces stimulus of the intestinal peristalsis and invagination of the small intestine into the larger, accompanied by simultaneous transudation and severe reddening and ecchymosis of the mucous membrane of the stomach. This production of muscular contractility might,

* 'Berlin. klin. Wochen.,' 1877, Nos. 27, 28.

however, be the result of the intense irritant action of the drug, and not a true stimulation. Horwitz* is a very strong opponent of the "ecbolic" theory, and considers it most improbable that the same remedy should bring on at the one time both sweating and labour pains.

Again, there is often painful muscular contraction of the bladder and a feeling of a weight over the pubes, but this may well be due to the irritation of very concentrated urine and the relative emptiness of the bladder, which is found in cases where pilocarpine has been given.

It is certainly difficult to account for some of the phenomena recently related unless some ecbolic power be allowed the drug.

Three theories have been advanced to account for the stimulant action of pilocarpine on the uterus:

(α) That owing to an increase in the amniotic fluid, over-distension of the uterine cavity is produced and contraction the result.

(β) That it produces rhythmical contractions by congestive action.

(γ) That the drug has a specific action on the uterine muscular fibre.

As regards the first, it is more than doubtful, for the questions as to the abilility of the amnio-chorion to absorb serous fluid from the congested decidua, and the possibility of pilocarpine finding its way in any manner into the fœtal circulation, are both undecided. And given that both these phenomena can occur, and that the urinary apparatus of the more mature fœtus aids in the increase of the amniotic fluid, judging by the results of pilocarpine on the adult, *oliguria* would be produced, and not polyuria; hence very little increase of the amniotic fluid would result.

I made careful measurements of the abdomen before and after injection of the drug, but failed to elicit any affirmative evidence of increase. We may, I think, put this view aside as improbable.

I must confess that it is impossible to distinguish cer-

* 'St. Petersburgh med. Wochensch.,' 1878, No. 38.

tainly between the theories β and γ, although the inability of the drug post-partum to stay hæmorrhage, and its effect on the tetanically contracted uterus, seem to indicate that its action upon the uterine muscular fibre is not specific.

Two important points with pilocarpine are to determine:

(1) The time which must elapse before its effects are produced upon the uterus.

(2) The length of the period of its efficacy upon that viscus.

The first is easily answered, for uterine action has been found to appear within three or four minutes of injection, but I have generally seen from ten to twenty minutes as the usual interval. It must be remembered that the effects on the uterus are much more lasting than those on the other organs of the body, and it becomes more excitable and capable of contraction.

In one case of Sänger's there was a cessation of the effect of the remedy for an hour and fifty-five minutes, while in another there was an interval of an hour and ten minutes after each of the two injections. Kleinwächter observed this after three injections, the pains, so to speak, "keeping him waiting." In Case 4, after the usual signs of pilocarpinisation had been shown to have disappeared by the sphygmograph, four distinct labour pains occurred an hour and three quarters after injection, showing that the experiences of the two observers mentioned were not merely accidental. The length of time may be calculated at about two hours. If no labour pains have appeared by then I consider pilocarpine has failed in its action. This may be termed, the "latent period" of pilocarpine.

This drug does not appear to act in the same degree on all individuals, nor indeed does it produce the same effect upon the same patient when applied at different times.

5. Albuminuria arising during pregnancy may be complicated or not with eclampsia, and our subject naturally divides itself into:—(a) The administration of jaborandi or pilocarpine in cases of albuminuria unattended by

eclampsia. (β) Attended by eclampsia occurring either ante-, intra-, or post-partum.

If a patient during any part of her pregnancy should develop albuminuric symptoms, are we justified in giving jaborandi or pilocarpine, knowing its ecbolic effects and the liability of women with this disorder to miscarry? On turning to clinical experience we find that, although very limited, the results are against its use. A case related by Fordyce Barker* shows that its administration, even when convulsions are not present, is likely to be followed by grave consequences. A 1-para in the seventh month of pregnancy was seized with difficulty of vision and headache. On examination, albuminuria was discovered. Cathartics and diuretics were tried in vain for a month. Extract of jaborandi in one-drachm doses was given at 3 p.m. and 7 p.m. by the mouth; considerable cyanosis and dyspnœa followed soon after. Left pleural effusion set in very rapidly, and death ensued. Barker attributes the result entirely to the drug. In another case of considerable œdema without albumen at first, he found some improvement following the earlier doses, but the excretion of urine was reduced to sixteen ounces in the twenty-four hours and a quarter albumen appeared; in addition great constitutional distress was caused and it was abandoned. Routine treatment was followed by means of cathartics and diuretics, and labour terminated normally.

Langlet,† on the other hand, reports a successful case, but without sufficient data to be of any value. I felt that with the above facts before me, its administration, although it might be attended with good results in some cases, on the other hand was of too hazardous a nature to be recommended. I therefore forebore making any experiments in this direction.

The effect of the drug on the urinary secretion has already been mentioned, and since the excretion of urea and its allies is doubtless diminished, so, probably, *a*

* 'New York Med. Record,' 1879, vol. xv, p. 196.

† 'Journ. de méd. et de chir. pratique,' vol. xlviii, p. 371.

fortiori, are its antecedents; and as the retention of these in the blood circulation is considered by many to be an active factor in the causation of eclampsia, it is an additional reason against its use.

Table III contains a complete analysis of thirty-nine published cases in which this drug was administered for puerperal convulsions. Twelve others were met with in the literature on this subject, but the reports appeared to me to be devoid of sufficient care and accuracy to warrant their insertion. Hydrochlorate of pilocarpine was given in thirty cases, the nitrate once only, while jaborandi was given six times as the fluid extract, and twice as the infusion.

Thirty-one mothers recovered, and there were eight maternal deaths, or 20·5 per cent. In ten cases jaborandi or pilocarpine was the sole treatment adopted; three deaths occurred, or a maternal mortality of 30 per cent.

On analysing the cases it will be found that in nineteen, no convulsions followed the administration of the drug and the patients recovered (2, 8, 9, 11, 12, 14, 17, 18, 19, 21, 22, 28, 29, 30, 31, 33, 34, 38, 39), two of them (21, 38) being at the time considered moribund. In nine other cases of the thirty-nine although the attacks occurred subsequently to its use, they were less severe, a favourable course was followed, and beneficial results accrued (1, 7, 10, 13, 15, 16, 20, 26, 37). In two cases (3, 27) the observers have directly stated that the drug had no effect on the attacks, but at the same time no ill effects were noticed.

On the other hand, there are nine cases (4, 5, 6, 23, 24, 25, 32, 35, 36) in which dangerous symptoms followed shortly after the exhibition of the drug, and of these two only (4, 23) recovered. Sänger's case was, as he himself states, only saved by the prompt injection of atropine. It must, however, be mentioned that in four cases (6, 23, 25, and 35) morphia had been given previously.

A point of considerable interest is that in nine cases venesection was carried out either before or after pilocarpine, and that only once did death result (Case 25).

Morphia (as has already been stated) was previously given, and the patient died undelivered. In severe cases of eclampsia, Spiegelberg strongly recommended this method, and it appears to be a fact that should pilocarpine fail to produce sweat after injection, a copious diaphoresis will be produced by the combination of venesection with it. In Whelen's first case (12), bleeding alone did not arrest the convulsions, but pilocarpine, when given soon after, succeeded; while in his second case (13) pilocarpine quite failed alone, but the fits ceased on the patient being bled.

In Sänger's case (26) pilocarpine was injected the first time without effect at 9.30 a.m. Venesection was performed at 10.20 a.m. In forty minutes the hitherto comatose patient responded when spoken to, and at 12.25, noon, a second injection produced copious salivation and sweat at once.

Bleeding, either before or after pilocarpine is administered, seems to act beneficially by lowering the blood pressure.

We have then as a summary, twenty-eight cases in which the drug either stayed the convulsions or some good resulted, two in which absolutely no result occurred, and nine in which dangerous symptoms manifested themselves.

It will be convenient here to mention the statistics of puerperal eclampsia when treated by other methods.

Dohrn collected 747 cases, and found a mortality of 29 per cent.
Hoffmeier „ 104 „ „ 32·4 „
Braun „ 73 „ „ 26·0 „
Johnston and Sinclair met with 63 cases, and found a mortality of 20 per cent. (+), or 1 in 5.
Ramsbotham in 30 years met with 43 cases with a mortality of 1 in 14·3.
Hall Davis „ 30 „ 1 in 11.

These figures will give an idea of the average mortality in this disease when taken as a whole, but it is most important to state whether the fits occurred ante-, intra-, or post-partum, as it is well known that as the labour advances, the mortality tends to decrease, so that the percentage is at its highest when the attacks occur only ante-partum, and

at its lowest when post-partum. Hubert* found that in 100 cases which he collected the mortality corresponded to the above statement.

In 19 cases	occurring	during pregnancy	there were	9	deaths =	47·37 per cent.
„ 54	„	during labour	„	11	„ =	27·77 „
„ 27	„	after labour	„	1	„ =	25·92 „

Löhlein† gives an exhaustive summary of 106 cases which came under his notice.

In 83 cases	occurring	ante-partum, and during dilating stage intra-partum, the mortality was ...	40·5 per cent.
„ 15	„	during expulsive stage intra-partum, 1 only died, and the mortality was ...	6·6 „
„ 8	„	post-partum, 1 died, and that was the result of some puerperal infection, and the mortality was	12·5 „
106			

Fordyce Barker‡ corroborates the above testimony, and in the years following 1855 found that the mortality for attacks occurring ante- and intra-partum amounted to 32 per cent., while for post-partum it was lessened to 22 per cent., this being further reduced subsequently to 14 per cent.

Now, how do these figures compare with those brought forward in Table III?

In thirty-two cases attacks occurred only ante- and intra-partum, with six deaths = 18·7 per cent., in seven cases attacks occurred only post-partum, with two deaths = 28·5 per cent., but in both of these either morphia or opium had been given previously which is a fact of considerable moment. These statistics certainly compare favourably with the foregoing, and I think that, as far as the smallness of the numbers enables us to judge, it can be safely said that the administration of pilocarpine for puerperal eclampsia does not increase the maternal mortality.

It is a well-known fact that the prognosis with regard to

* 'Dictionnaire Encyclop. des Sc. méd.,' 1e série, t. xxxii, p. 185.

† 'Zeitschrift f. Geburt. u. Gyn.,' Bd. iv, p. 88 (1879).

‡ 'The Puerperal Diseases,' 1874, p. 125.

the children in all cases of puerperal eclampsia must always be considered serious, about one half succumbing.

Hall Davis* found that out of thirty-six children twenty-six were born alive and ten stillborn, or a mortality of 27·8 per cent. This is, however, too low; Wieger† collected the large number of 396 cases, and found that there were 217 born alive and 179 dead, or a mortality of 48 per cent. This high rate is due to fœtal asphyxia, hæmorrhages into the brain or other organs, blood contamination, and finally intra-uterine eclampsia.†

In testing the influence of jaborandi or pilocarpine on the life of the child, we must of course eliminate from our calculations those cases in which it was given post-partum, viz. in seven cases with eight children (1, 6, 11, 22, 29, 30, 35). Hence inquiry must be made into the birth of thirty-three children (one twin), of whom eleven were born alive and fourteen stillborn. Unfortunately, the fate of seven cannot be given, and one remained undelivered.

Out of twenty-four children whose fate was noted, we find the mortality is fourteen, or 58·4 per cent., nearly 10 per cent. in excess of the usual average. In three cases the fœtus was macerated, and although this is a condition not unfrequently found without the administration of the drug, still it is a noticeable fact. It seems therefore that we must conclude that pilocarpine has a slight but perceptible influence on fœtal life.

If we consider that the theory laid down by Bidder‡ in 1867 is correct, viz. that eclampsia is due to cerebral anæmia from vaso-motor spasm, then pilocarpine, from its proved properties, should be of service in relieving that spasm. Apparently it does so, but unfortunately it has been found that such serious and rapidly ensuing lung mischief may occur after its administration that anyone using it necessarily incurs grave responsibility.

The suffocative symptoms which arise must be attributed

* 'Trans. of Obstet. Soc.,' 1870, vol. xi, pp. 268—313.

† 'Dictionnaire Encyclop.,' l. c.

‡ 'Beiträge zur Gynäkologie,' pp. 188, 213.

to an inability to expectorate the enormous quantity of mucus poured into the bronchi, to pulmonary œdema, cardiac weakness, and even partial closure of the larynx by the sinking backwards of the enlarged tongue. What can certainly be laid down here is, that it is absolutely contra-indicated where there is slight bronchial catarrh, as the drug produces enormous increase of already existing secretion, or where very deep coma is present, thus preventing the patient from expelling the mucus by her own efforts from the bronchial tubes.

That it is of extreme value sometimes is proved by the cases reported by competent observers and referred to in the Table, but we have yet to learn more definitely in which cases to give it and in which to withhold it, and I must confess that as yet I see no likelihood of the question being elucidated.

The action of pilocarpine on the fœtus.—The effect of pilocarpine on fœtal life in eclampsia has already been discussed. It seems, however, doubtful whether it has the power of passing into the fœtal blood, and its stay in the maternal circulation must be very short. Ludwig examined a case post mortem immediately after the injection, and found no signs of pilocarpine in the blood of the vena cava inferior.

In whatever method pilocarpine acts on the system it certainly affects the fœtus. I have found that the fœtal movements are often considerably increased a few minutes after injection, being both subjective and objective. Others have observed the same phenomenon.

In Table IV I have recorded the number of fœtal pulsations found after injection in three instances and at various intervals of time. The maternal pulse has always been found increased after ten minutes have elapsed, and usually there is a corresponding increase in the fœtal pulsations. It will be seen, too, that the effect on the fœtal heart appears of longer duration than that on the mother's, although the maximum increase is usually about the same

time. Irregularity, intermittence, and weakness of the fœtal pulse have been observed and noted under each individual case, but as these phenomena occur in normal labours too much stress must not be laid upon them.

So long as the bag of waters is intact, the fœtus does not appear to feel the effects of the remedy, and "pilocarpinisation" of the mother may therefore be said to have no serious effect on fœtal life. Kleinwächter met with two cases in the expulsive stage, in which such lengthened and strong pains resulted that the children were born asphyxiated. On the other hand, Sänger reports severe cyanosis and opisthotonos in the mother without any ill effect on the child. I think that when the membranes are ruptured, and pilocarpine is given to overcome some obstruction, its administration may be said to be injurious.

Complications attendant on the use of pilocarpine.—I have not in any of the cases in which I gave pilocarpine intra-partum found any inconvenience from the intoxication phenomena, but when administered for induction of premature labour they were much more marked, especially the vomiting. Gubler and Robin* attempted to lay down as an almost absolute rule, "that whenever the hyper-secretions habitually induced are absent, or undergo a notable diminution in their general and collective intensity, then compensatory action is always found in the digestive canal."

Salivation appears to be most serious in induction cases, and the patient should be instructed to expectorate the saliva and not to swallow it, thus preventing the stomach becoming filled with mucus. The lateral decubitus must be adopted, especially if coma be present, so that the tongue does not fall back over the glottis, and in order to allow the saliva to dribble out of the angles of the mouth.

The vomiting is chiefly bilious mucus. Zaubzer declared that this could be stayed entirely by administering the pilocarpine some time after a meal, by giving spare diet,

* 'Gazette Médicale,' 1875, March 20th.

and allowing the patient to swallow small pieces of ice (Eispillen). I have tried these preventives and found them useless. Senator* recommended nitrate of amyl before, after, and during the toxic effects, but with little apparent success. Zielewicz† recommends the combination of pilocarpine and morphia, especially in renal cases. I have already given my firm conviction against this treatment while speaking of eclampsia.

Collapse has been met with by Leyden.‡ He thinks that vomiting and collapse from pilocarpine stand in a reciprocal relation to each other; the emetic effect producing the collapse by the severe lowering of the blood-pressure. I have not met with this untoward event, nor can I meet with any other observer who has.

Asphyxia has been mentioned already, and should this threaten the treatment is artificial respiration, and the subcutaneous injection of sulphate of atropine.

The proper dose for administration.—Massmann thinks that the smallest dose for subcutaneous injection should be twenty minims of a 2 per cent. solution. It seems doubtful whether a less dose would produce uterine irritation. Case 1 seems to confirm this statement, as with three injections of twelve minims followed by one of fifteen minims, I obtained not a semblance of a result so far as the uterus was concerned, although all the intoxication phenomena were present. In Case 2 twenty minims, given three times, proved equally ineffective. Rosenkrantz§ has increased the dose to twenty minims of a 6 per cent. solution without any phenomena being observed other than usual. No maximum dose has apparently been fixed, and this might very well suffice as one. Sänger gave as much as four doses of a 2 per cent. solution in one day without bad result; he thought that women in labour

* 'Berliner klinische Wochenschr.,' 1877, No. 42.

† 'Centralzeitung für Kinderheilkunde, 1878, No. 14.

‡ 'Berlin. klin. Wochen.,' 1877, No. 28.

§ 'Deutsche med. Woch.,' 1877, No. 9.

appear to bear larger quantities, and I can confirm this statement in that the disagreeable toxic effects are much less noticed during labour. In the dilating and expulsive stages, a smaller dose seems quite sufficient to accelerate the pains. In Case 5, one injection of fifteen minims, of a 2 per cent. solution, was ample to terminate labour. The drug was formerly given as the fluid extract of jaborandi, and by the mouth; this method had obvious disadvantages, and to Ortille* the credit is due of having first suggested the hypodermic injection of pilocarpine. I have made it my practice to inject the solution, as a rule, into the right buttock, as the patient lies in the left lateral decubitus; but naturally either buttock or forearm would be equally satisfactory. There does not seem to be any advantage gained by choosing the abdominal wall as the site for injection. Too much stress cannot be laid on using the preparation freshly prepared; in a properly stoppered bottle a solution will keep good for at least two months.

Contra-indications to administration.—As has already been sufficiently demonstrated, pilocarpine should never be used in pulmonary or bronchial catarrh, or in pleural effusions, complicating pregnancy. The consensus of opinion seems also decidedly against its employment in pregnancy attended by cardiac disease. Popow† found acceleration, then slowing of the heart's action in his experiments on animals, and in larger doses, cessation in diastole. Much of course depends on the variety of heart trouble present, but stasis and irregularity of rhythm are very easily produced. Petrinas‡ and Lösch§ warn us most emphatically against its use in these cases.

* 'Bulletin gén. de Thérapeutique,' 1877, vol. xcii, p. 226.

† 'Inaug. Dissertation,' Petersburg, 1878.

‡ 'Deutsche Archiv für klin. Med.,' April, 1878.

§ Ibid., Bd. xxi, Hft. 2 und 3.

On a peculiar cardiac effect following chloroform-inhalation during "pilocarpinisation."

Dr. Galabin has communicated the following, I think, unique experience* (Table III, Case 31). The patient was seized with eclampsia intra-partum. A pulse tracing showed "the pulse to be regular and of somewhat high pressure . . . . the systolic summit somewhat broad, but without any distinction between the primary and tidal wave." Pulse 80 beats per minute. Pilocarpine was given by mouth in three doses of one third of a grain each, with a twenty minute's interval; full effects followed after the last dose. While under the influence of the drug, a second tracing was taken, the pulse meanwhile having risen to 90 beats per minute. "The curve had become somewhat higher and more pointed, and a slight notch was shown between the primary and predicrotic wave." Some amount of diminution of arterial tension was therefore the result of the pilocarpine, but much less than a moderate dose of nitrite of amyl would produce. Chloroform was administered during the labour to facilitate the dilatation of the cervix; a remarkable acceleration of pulse then took place, the rate being 180 per minute. When inhalation was stopped it fell to 95, and with the exhibition of chloroform again the pulse rose "to 200 and over," becoming too rapid to be counted, but it again fell to 90 as the patient became sensible. Now the usual result of chloroform in labour is to *diminish* the rapidity of the pulse, while pilocarpine, as has already been shown, accelerates the heart's action. Dr. Galabin thought it seemed probable that "the chloroform paralysed some inhibitory mechanism," by which this latter influence (*i. e.* the effect of pilocarpine) "was kept in check so long as consciousness existed." This view must, I think, be accepted, indeed I can offer no other. I have been unable to find any other case bear-

* 'British Medical Journal,' 1879, ii, pp. 729 and 730, and personal communication.

ing on this point, and must therefore be satisfied with the bare narrative of facts. It, however, points to an additional possible danger attached to the simultaneous administration of pilocarpine and chloroform, at least during eclampsia.

Other interesting questions arising in connection with this subject are:

(α) The antagonism of pilocarpine and atropine.

(β) The comparative value of pilocarpine and ergot as ecbolics.

(γ) The value of the drug in lactation.

Facts concerning them are extremely few, and, moreover, they appear to me to be outside the subject at issue. I therefore pass them over with this brief notice.

Conclusions.

1. Pilocarpine is certainly able to induce labour, but under certain conditions, these being where there is a tendency to expulsion of the ovum; but even then its action is most uncertain. In cases, however, where vaginal manipulations are to be avoided as much as possible, it should always be given a fair trial, as the drug has certainly no permanently bad effect on the mother and none on the child before rupture of the membranes.

2. During the dilating and expulsive stages of labour it is equally productive of increase of labour pains with ergot, but with more certainty. It has, moreover, this advantage, viz. of producing no tetanic uterine spasm. The drug should never be given, however, when there is reason to suspect any obstacle to the progress of the head, as rupture of the uterus, or death of the fœtus might take place. Its value is greatest in simple uterine inertia.

3. It is absolutely useless as a post-partum hæmostatic agent, and it is doubtful whether it in any way furthers the process of involution.

4. In albuminuria without convulsions, or in pregnancy

with albuminuric symptoms, it is a remedy that should not be employed until other means have failed; when coma is present it is most dangerous, owing to the rapid formation of mucus in the bronchial passages and consequent production of asphyxia; it appears to stay convulsions when successful, by relieving the cerebral anæmia present.

5. It has no evil effect on the mother, no increase in morbility or mortality having been noticed where it has been given, nor is the fœtal mortality increased when the drug is administered under the proper conditions; but there seems sufficient evidence for the assumption that in puerperal eclampsia it does slightly endanger the life of the fœtus.

6. There is strong evidence to prove that preparations of opium given before pilocarpine materially add to its dangers, and that strict inquiry should always be made on this subject before the latter is administered.

7. The patient should always lie down for an hour after injection, as giddiness and irregularity of pulse may follow movement into the upright posture.

8. It should never be injected, even intra-partum, without informing the patient fully of its probable effects.

Dr. CHAMPNEYS thought that the paper just read ought not to be allowed to pass without any comment. It was a most valuable summary of our knowledge on the subject, and would render reference easy in the future. He confessed that it had not made him feel anxious to use the drug.

Dr. HERMAN thought that much thanks and credit were due to Dr. Phillips for bringing together as he had done all that was known about this subject. But he did not find himself able to follow the author in all his conclusions. Dr. Phillips said that "during the dilating and expulsive stages of labour pilocarpine is equally productive of increase and intensification of labour pains with ergot, but with much more certainty of action and with none of its ill effects." He (Dr. Herman) thought that there were few drugs so certain and so definite in their action as ergot. Ergot produced its effects whenever it was administered, whether in the first, or the second, or the third stage of labour, or when the uterus was in labour with a fibroid, and there were no bad effects from ergot. There might be, it was true, bad effects from giving ergot in improper cases, just as there might

be from any other powerful drug if given when its use was contra-indicated. Whenever it was beneficial that uterine contraction and retraction should be produced, ergot might be given with confidence that this effect would follow, the cases in which it did not being the exception, and the causes of this exceptional want of response to the drug being pretty well known. But the effect of pilocarpine during the first and second stages of labour did not follow in every case, and that which did follow was transitory, and in the third stage of labour, when certainty of action was especially wanted, its advocates admitted that it was valueless. The pains of the first and second stages of labour were temporarily increased or diminished by so many different causes, that to demonstrate the action of any agent upon the uterus the effect ought to be very marked and constant. The frequency with which the entrance of the accoucheur into the room caused temporary cessation of pains, was an example, but no one would suppose that the movements of the accoucheur had any special effect on the uterus. Therefore the evidence failed to convince him that pilocarpine in its effect on the uterus was at all to be compared with ergot either as to power or certainty. And, assuming that the effect could be relied on, he thought that, remembering the sweating, the giddiness, &c., which resulted from pilocarpine, there were fewer objections to the use of forceps. The author had warned others against the use of pilocarpine in puerperal eclampsia, especially during coma, on the ground of the dangerous liability to filling of the bronchial tubes with secretion. He (Dr. Herman) quite concurred with that warning, but would extend it, for in those eclamptic patients who recovered from the convulsions, coma, &c., the great danger was from pulmonary complications, bronchitis, pneumonia, &c., resulting from the great congestion of the lungs during the fits, and he thought the liability to these lung troubles would be increased by pilocarpine. But he was unable to reconcile the author's emphatic and valuable warning with his subsequent statement that the "mortality is not greater under this mode of treatment than under any other." If the dangers against which he had warned were real, surely they must raise the mortality. He (Dr. Herman) thought we had no satisfactory standard by which to estimate the mortality in puerperal eclampsia, because we did not know what was the average mortality when the disease was left untouched.

Dr. Dyce Brown said that the most striking point brought out in Dr. Phillip's paper was the extreme uncertainty in the action of pilocarpine as an ecbolic, the failures being much more numerous than the successes. Any such drug which "was useless post partum and to stay hæmorrhage," must be very untrustworthy as an ecbolic, and it seemed to him to be a

valueless addition to our armamentarium. In eclampsia it was not only of no use, but was positively dangerous, and therefore should never be employed. The dose producing the dangerous symptoms was the same as that given in other cases, so that there seemed no guide as to whether a given dose would be injurious or not.

Dr. JOHN PHILLIPS said that he had undertaken the researches with the greatest impartiality, and that before commencing them he had studied all the literature upon the subject, and had condensed the results in the Tables shown. He laid especial stress upon the danger of its use in puerperal eclampsia, a matter which had not appeared to him to have received sufficient attention. Sänger's idea that its use might supersede the forceps was necessarily chimerical, and should not be entertained for a moment. He was sorry that all his evidence pointed to the fact that pilocarpine was not desirable as an ecbolic remedy, and that no positive evidence of its value could be adduced.

NOVEMBER 7TH, 1888.

JOHN WILLIAMS, M.D., President, in the Chair.

Present—41 Fellows and 3 Visitors.

Books were presented by Dr. Bozeman, Dr. Cullingworth, Dr. Frederic Hewitt, Dr. Leishman, the Royal Medical and Chirurgical Society, the Clinical Society of London, the Council of University College, the New York Academy of Medicine, and the Medical and Chirurgical Faculty of the State of Maryland.

Herbert Campbell Burton, L.R.C.P.Lond. (Blackheath); and William Japp Sinclair, M.D.Aber. (Manchester), were declared admitted Fellows of the Society.

The following gentlemen were elected Fellows:—William Macfie Campbell, M.D.Edin. (Liverpool); Charles Newton Cornish, L.R.C.P.Edin. (Bushy Heath); Henry Edward Haycock, L.R.C.P.Edin. (Welwyn); John Mackern, B.A., M.D.Cantab., F.R.C.S.; and John Bland Sutton, F.R.C.S.

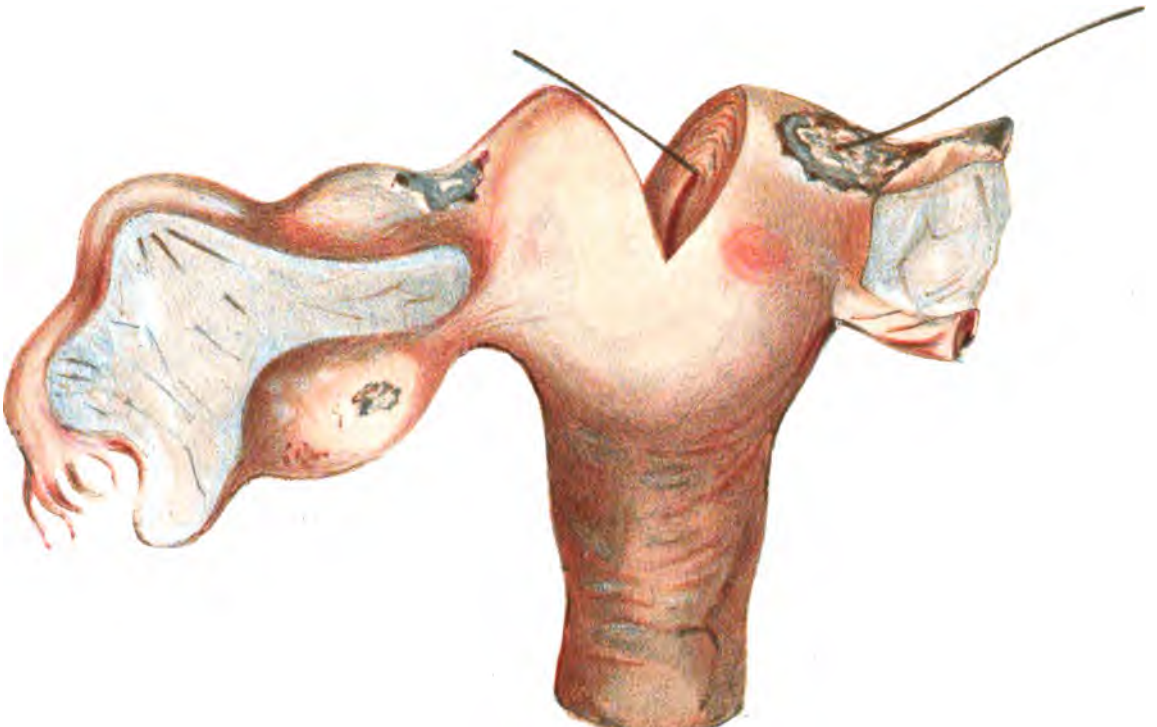
LOCALISED SLOUGHING OF FUNDUS UTERI IN A CASE OF ACUTE SEPTICÆMIA FOLLOWING ABDOMINAL SECTION.

By Charles J. Cullingworth, M.D.

Dr. Cullingworth exhibited a specimen and coloured drawing of the uterus and adjacent parts (see Plate VI) from a patient, aged 19, who was operated upon for the removal of a gradually-increasing hydrosalpinx of the right side, the result of gonorrhœal inflammation. The operation was easy and uncomplicated, the distended tube had become folded upon itself, and lay behind the body of the uterus. The only adhesion was to the omentum. The temperature during the first twenty-four hours was under 100° Fahr. It then suddenly rose to 101·8°, the pulse increasing in rapidity from 114 at noon to 144 at 4 p.m. The patient complained of severe pain on the left side, and vomiting, which had been present ever since the operation, became more frequent. The temperature fell a little, and the pulse became less rapid, but in a short time signs of collapse supervened, and the patient died fifty-six hours after operation, and thirty-two hours after the sudden rise of temperature.

The post-mortem examination showed recent lymph on the peritoneum in the lower part of the abdomen, with adhesions. In the pelvis was a small quantity of thick pus. A band-like process of omentum passed to the uterine end of the left Fallopian tube, and was firmly united there. The pedicle (on the right side) was firmly ligatured. The left ovary was of normal size; on section it was obscure and much softened. The left tube was a little dilated, especially its distal part, and contained some thick pus. The cavity of the uterus was of average size, the mucous membrane covered with fluid blood, probably menstrual.

The uterus, &c., were removed for further examination.



Ulceration of intra-uterine portion of both Fallopian tubes with perforation at each Cornu of the uterus.

P.F. Holding sc.

West Newman & Co. chrom.

On the peritoneal aspect of the upper border of the uterus, over each cornu, was a small black patch, beneath which was a slough, extending on the right side to the interior of the intra-uterine portion of the Fallopian tube, and thereby opening up a direct communication between it and the peritoneal cavity. On the left side the slough was smaller, and no such direct communication appeared to exist. The left tube was thickened and contained a little thick pus; near its uterine extremity were two hard nodules which, on section, proved to be circumscribed exudations around the whole circumference of the lining membrane of the tube, of pale colour and firm consistence.

The dilated tube, removed at the time of operation, was exhibited, but, except that it was a typical specimen of hydrosalpinx, it offered no occasion for remark. Dr. Cullingworth had brought the case before the Society on account of the condition of the uterus as discovered after death. He had not seen anything of the kind before, and as this was the first case of septicæmia after operation that had happened to him for many months he was anxious to find an explanation. Was it a result of acute sepsis, or was it connected with the gonorrhœa? It will be noted that the sloughs were situated symmetrically, and were in each instance at the site of an omental adhesion.

The sloughs were, to him, the more remarkable in that the uterus was by no means prone to putrefactive change, being indeed the very last organ in the body to undergo post-mortem decomposition.

Postscript.—After the meeting at which the above specimen was shown, Dr. Cullingworth had his attention called by Dr. Lewers to the fact that a suppurating Fallopian tube might ulcerate and rupture at a portion that was undilated, as in an instance brought by him before the Society in 1885 ('Transactions,' vol. xxvii, p. 298), and it was suggested that this might have taken place in the specimen above described. Accordingly, the preparation was next day submitted to a further and more minute examination by Mr. Shattock, who found Dr. Lewers's

suggestion borne out. Tracing the right tube from within outwards, he found the first half of the intra-uterine portion healthy, the second distinctly ulcerated, and, for 7 mm. of its length, laid open by perforation. From the uterus to the point of division and ligature the appearance of the mucous lining of the tube was normal. The diseased portion corresponded to the gangrenous spot seen at the post-mortem examination. At the site of the gangrenous spot on the left side, the remains, probably, of a less recent perforation, the tube was impervious, and its coats were softened and of a deep red colour. No perforation could now be discovered. The innermost quarter of an inch of the intra-uterine portion of the left tube was normal. The fatal result was evidently due to perforation of the diseased Fallopian tube on the right side, with escape of pus into the peritoneal cavity, causing septic peritonitis.

A UTERUS WITH SLOUGHING FIBROID.

By Herbert Spencer, M.D.

AN EIGHTH MONTH ANENCEPHALIC MONSTER.

By Herbert Spencer, M.D.

THE UTERUS, WITH ITS CONTAINED PLACENTA, REMOVED FROM A RACHITIC WOMAN, AGED THIRTY, BY PORRO'S OPERATION.

By Dr. William Duncan.

A UTERUS, WITH ITS APPENDAGES, FROM A SINGLE WOMAN.

By Dr. William Duncan.

MICROSCOPICAL SECTIONS OF THREE VARIETIES OF SOLID, NOT MALIGNANT, TUMOURS OF THE OVARY.

By W. S. A. Griffith, M.B.

1. Diffuse fibrous hyperplasia, a condition commonly occurring in connection with uterine fibroids, which does not lead to the formation of a large tumour, though the ovary may be enlarged to from four to eight times its usual size. The connective tissue in these cases is chiefly of the usual dense, well-developed, non-nucleated type, though mixed with the characteristic spindle-cells of the ovarian stroma.

2. Hyperplasia of the remains of corpora lutea. The dense cicatricial tissue which persists for a considerable length of time as the final remains of the development of corpora lutea, may apparently, under circumstances not yet ascertained, undergo great enlargement, either singly or in many parts of the ovary. The connective tissue in these cases is very dense, non-nucleated, and contains no spindle-cells. The enlargement of the ovary is apparently not greater than in the former case.

3. Diffuse hyperplasia of the ovarian stroma, the principal subject of Mr. Doran's valuable paper (p. 410). The tumours in these cases may be very large, and are usually not malignant. They are composed of masses of spindle-cells, with, in places, a moderate amount of well-developed connective tissue. The histological difficulty Mr. Doran has attempted to solve is one of great difficulty and of practical importance, first, to decide whether these tumours are spindle-celled sarcomata, and therefore malignant, or whether, on the other hand, if not malignant, they are composed of connective-tissue cells or muscle-cells analogous to the fibro-myomata of the uterus.

4. A fibro-myoma of the uterus, containing extensive tracts of lymph-gland (adenoid) tissue. Dr. Griffith had met with this condition in two instances.

ON MYOMA AND FIBRO-MYOMA OF THE UTERUS AND ALLIED TUMOURS OF THE OVARY.

By Alban Doran.

(Received February 15th, 1888.)

(*Abstract.*)

Myoma of the uterus is very common, fibroma of the ovary rare. The study and comparison of these tumours involve the distinction between true muscle-cells and certain cells found in fibrous tissue and in sarcomata. Some pathologists declare that there is no true distinction. Certain recognised types, such as the plain muscle-cells of the walls of blood-vessels, and the muscle-cells of the pregnant, non-pregnant, and fœtal uterus, are compared in this memoir with the cells of tumours evidently made up of fibrous tissue, or evidently sarcomatous, or otherwise malignant. Each type is illustrated not only by verbal descriptions but also by accurate drawings executed by a competent artist.

The histology of the uterine wall is not a very complicated subject. Plain muscle-cells mixed with more or less connective tissue, and arranged in bundles, are the chief constituents of the wall, and extend not only to the tube but also to the round ligament and the ovarian ligament, true processes of the uterus. A non-malignant tumour made up of muscle-cells very commonly develops in the uterine walls, or may form in one of the uterine processes. This is myoma of the uterus. From the uterine connective tissue white fibre may be developed, hence the origin of fibro-myoma of the uterus. Klebs' and Kleinwächter's theories are discussed. The muscle-cells of a myoma are usually larger than those of the uterus in which it grows. Hence in a myoma removed during pregnancy they appear very large. The comparison of the muscle-cells with the smaller cells

of similar appearance found in the white fibrous tissue in a fibro-myoma is important, especially in relation to suspected cases of myoma of the ovary.

The histology of the ovarian stroma in woman is, on the other hand, very unsettled. Ideas on the subject are too often gleaned from the study of animals' ovaries. Harz's researches show how this study may lead to grave fallacies. The tissue of the hilum and parenchyma is described, and allowance is made for changes in the follicles (corpora fibrosa of Patenko, &c.). True fibrous tissue is naturally abundant in the tissue of the hilum (paroöphoron); this fact is enough to account for fibroma of the ovary. Muscular tissue is found amidst the parenchyma of the ovary in the coats of its vessels, and also in free bundles derived from the ovarian ligament, a process of the uterus. The connective tissue of the ovary around the follicles (stroma of the parenchyma, as distinguished from the tissue of the hilum) is variable in character, but as a rule of a young type. Common changes due to inflammation must be borne in mind.

Fibroma of the ovary is a well-known but rather rare disease. Its development is accounted for above. Sarcoma of the ovary is not so rare, owing probably to the frequent abundance of "young" connective tissue. Specific spindle-cells of a sarcoma are compared with the connective-tissue cells in fibroma. The existence of fibro-myoma of the ovary has been disputed. As muscular tissue naturally exists in the ovary the development of myoma can be accounted for. The difficulty of distinguishing muscle-cells from certain cells in the other tumours described in this paper is admitted, yet, by comparing a fibro-myoma of the uterus with a tumour of similar characters growing in the ovary, it appears that this distinction can be made, and hence there is little doubt that a fibro-myoma may develop in the ovary. At least, plain muscle-cells, the fusiform cells of fibrous tissue, and the specific spindle-cells of a sarcoma, may in many cases be distinguished from each other.

Myoma of the uterus is very common, fibroma of the ovary is rare. This fact is universally admitted, yet the study of myomata and fibromata includes a most difficult task,—the distinction between true muscle-cells and cells

found in fibrous tissue and in sarcomata. Some authorities assert that no such distinction can be defined; Virchow, Billroth, and Winiwarter are especially doubtful on this point. The question must be solved, firstly, by the labours of general histologists and pathologists, who have yet to trace more accurately than heretofore the differentiation of indifferent embryonic tissues, and to determine how far we can depend upon the effects of staining materials. Secondly, this question demands for its solution a line of research which this memoir is designed to encourage. Certain recognised types, such as the muscle-cells of the walls of blood-vessels, and the muscle-cells of the pregnant, non-pregnant, and fœtal uterus, will be compared with the cells of tumours evidently made up of fibrous tissue, or evidently sarcomatous or otherwise malignant. Through the known we may succeed in determining the unknown. The cells and their arrangement must be kept before the eye whilst they are being talked about. For this reason I exhibit this evening a series of microscopic preparations. I further submit to the Society a collection of drawings of these preparations as seen with a one-eighth inch objective. These drawings were executed under my superintendence by Mr. Lewin, a painstaking and accurate artist.

I shall employ the term "muscle-cell" throughout the monograph, the expression "muscular fibre" being confusing. Non-striated muscular tissue and leiomyoma is in every case understood, unless the terms "striated muscular fibre" and "rhabdomyoma" are employed. Again, by "spindle-cells" I mean the cells of a true spindle-celled sarcoma only, by "fusiform cells" any cells which are spindle-shaped. As to rhabdomyoma or striated muscular tumour of the uterus, only seven cases have been described. It always takes the form of a racemose tumour of the cervix, distinctly resembling hydatid mole, and is essentially malignant. The cells are very large, fusiform, and, as Dr. Pernice has discovered, distinctly marked with transverse striæ. Thus they resemble striated muscular tissue in early fœtal life; in fact, they represent early and

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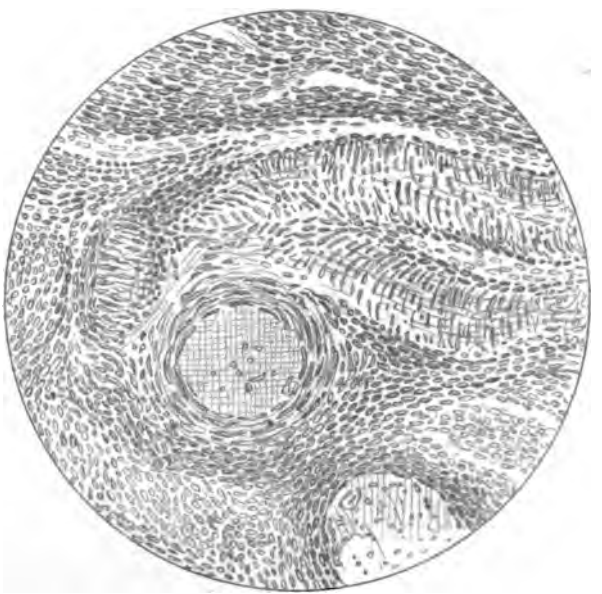

Section of the Uterus of a Child aged 11.

Two large vessels run across the field from the right to the centre, where another vessel is seen in transverse section. The muscle-cells of their middle coats are well displayed. Between the vessels are seen the stout, short nuclei of the young muscle-cells of the uterine tissue.

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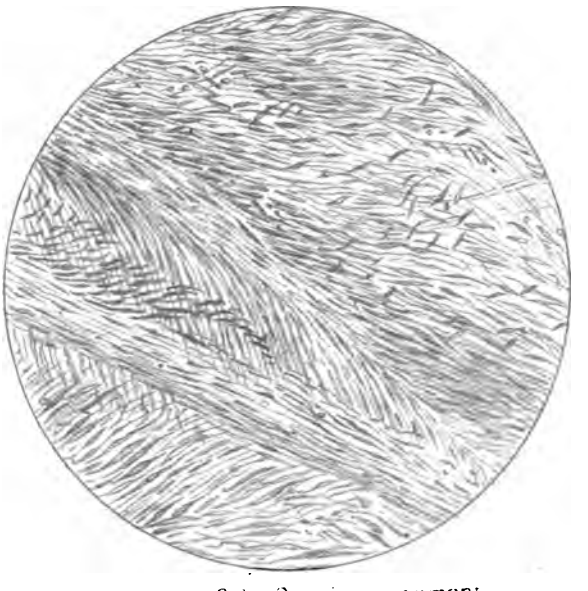

Myoma of the Ovarian Ligament.

Showing muscle-cells unmixed with any other structure

West, Newman & Co. lith.

extreme histological specialisation, and hence the subject of uterine rhabdomyoma is foreign to this monograph, as I confine myself to comparisons between far more generalised structures, namely, fibrous tissue, spindle-cells of sarcomata, and plain muscle-cells. Otto Weber has found striated muscle-cells in uterine polypi, possibly incipient forms of the racemose malignant tumour of the cervix. He believes that they arise by direct conversion of plain muscle-cells. The subject is ably treated by Dr. Pernice ("On Racemose Myosarcoma Striocellulare Uteri," 'Virchow's Archiv,' vol. cxiii, part 1).

I shall begin by a consideration of MYOMA OF THE UTERUS. This subject is in many respects easier than the study of ovarian new growths. The structure of the uterine wall is fairly constant, even in its changes, from early fœtal life to old age. In sections from a four-months' fœtus I found that the muscle-cells were already well formed. Each cell was of the spindle shape seen in the non-pregnant adult uterus, and tapered gradually; the nucleus was elongated, but wider than in the adult. Tourneux and Legay* and Cadiat† represent the fœtal uterine muscle-cells after the pattern just described, but do not figure any bulging of the nuclei. In sections from a seven months' fœtus the muscle-cells near the fundus were well developed, and the nuclei were of the form which they assume in the adult. Towards the cervix and around large vessels, the muscle-cells seemed younger than elsewhere. In Fig. 1, representing a section of the uterus before puberty, the muscle-cells forming the middle coat of the blood-vessels closely resemble the same cells in well-developed uterine tissue, whilst the muscular tissue outside the blood-vessels is less characteristic, the nuclei being stout, though elongated, and the remainder of each cell hardly distinguishable. The gradation from these nuclei to

* "Mémoire sur le développement de l'utérus et du vagin envisagé principalement chez le fœtus humain," 'Journal de l'Anatomie et de la Physiologie,' tome xx, 1884; see especially pl. xxv, figs. 24—26.

† "Mémoires sur l'utérus et les trompes," ibid., see pl. xxvii, fig. 12.

fully developed uterine muscle-cells was evident in the specimen now described. The presence of the youngest tissue nearest to the vessels may indicate that Kleinwächter's theory, which will presently be quoted, applies to the development of the uterus as well as to the formation of myomata.

The natural variations in the amount of connective tissue in the uterine walls, and the changes in the muscle-cells during pregnancy, are also tolerably well understood. The chief difficulty in the study of the histology of the uterus lies in the intricate arrangement of its fibres. Hence it is all the more important to study the individual cell.

We may take for granted, firstly, that the walls of the uterus are made up of plain muscle-cells, with a varying amount of connective tissue, which is never so purely fibrous as the substance of a fibroma. Secondly, that the muscular tissue of the walls extends to the round ligament and to the ovarian ligament which are true processes of the uterus.* Thirdly, that a pathologically innocent tumour, made up of plain muscle-cells with a varying amount of fibrous tissue very frequently develops in the uterus and may form in the round ligament (see Mr. Stanley's specimen in the Museum of the Royal College of Surgeons, Path. Series, No. 386) and in the ovarian ligament (author's case, 'Trans. Path. Soc.,' vol. xxxviii, p. 245).

The morbid anatomy of uterine myoma is well known. Nothing need here be said about its submucous, interstitial, subperitoneal, and polypoid varieties. Gusserow ("Die Neubildungen des Uterus," Billroth and Luecke's 'Deutsche Chirurgie," Lieferung 57) has little to say on the histology of myoma. In relation to the fibrous element, he observes that the more the fibro-myoma is a simple hypertrophy or rather hyperplasia of the uterine tissue as in pregnancy, but localised instead of general, the more will the plain muscle-cells preponderate, and the growth will be a pure myoma; the more a kind of fibrous induration of the

* I put aside for the present the significance of muscle-cells in the utero-sacral and broad ligaments, and the continuity of rows of muscle-cells proceeding from the uterus along the ovarian ligament into the ovary.

interstitial connective tissue takes a part at the beginning or in the course of development in pushing aside the muscular fibrils, the more nearly will the growth be a pure fibroma. Such observations are philosophical rather than scientific. The cystic and degenerative changes which many "fibroids"* undergo are well known.

The development of muscle-cells and their alleged proliferation are questions more to the purpose in this memoir. That muscle-cells proliferate in the adult has not been proved; I can find no evidence of the proliferation theory except in books. Klebs noticed that the formation of muscular tissue went on simultaneously with the development of vessels and the consequently freer access of nutrition. Dr. Kleinwächter† appears to have made an important discovery, suggested perhaps by the above theory of Klebs. He examined incipient, almost microscopical myomata, which he found under the serous coat of the uterus in the post-mortem room. In these minute growths he found the muscle-cells larger, as a rule, than in uterine tissue. The incipient myoma was more or less circumscribed, fusiform or pyriform, with a tapering pedicle, a point of special importance. The capillaries near the myoma were surrounded by parallel rows of round-cells, which were sometimes undergoing proliferation and were smaller in diameter than the neighbouring muscle-cells. This process involved the destruction of the capillary. Dr. Kleinwächter traced the round-cells developing into muscle-cells through an intermediate fusiform type. I have already suggested that this is possibly the manner in which the normal muscular tissue of the uterus is developed. In fig. 1 the capillaries are seen to be surrounded by nuclei rather stouter than those of well-formed muscle-cells, and certainly less elongated. I find that the further the section is examined away from the vessels, the more the stout nuclei are replaced by muscle-cells.

* By this term I mean to designate all myomata, fibro-myomata, and cystic myomata of the uterus.

† "Zur Entwickelung der Myome des Uterus," 'Zeitschrift für Geburtshülfe und Gynäkologie,' Band ix, p. 68.

Dr. Kleinwächter found that the process above described ended by destroying the capillary, which ultimately remained as the tapering point of the myoma. A cluster of minute myomata corresponded to the conversion of several branches of a capillary into new growths. In a case of death a few hours after labour he found a minute uterine myoma, the cells of which had shared in the hypertrophy of pregnancy, but to a less degree than the normal uterine tissue. The round-cells were abundant, and were not only massed round the vessels in the myoma, but also lay between the fasciculi and in the connective tissue of the capsule. I shall say more, presently, on the hypertrophy of the muscle-cells of a myoma in pregnancy.

MYOMA OF THE NON-PREGNANT UTERUS is made up of muscle-cells resembling those which compose the uterine wall.* The fibres interlace in all directions and in many degrees of density. Fig. 2 is a good sample of this kind of tumour. It grew in the ovarian ligament, a process of uterine tissue, and the uterine walls were infested with similar growths.† In the drawing the field is entirely covered with small, very elongated muscle-cells. No other kind of cell nor any fibrous or vascular structure can be seen. The muscle-cells are mostly arranged in rows which branch laterally, suggesting, perhaps, their original development from capillaries. It may be noted that the cells in this drawing much resemble the muscle-cells in the coats of small vessels (fig. 1). They are much smaller than the muscle-cells of a myoma in pregnancy (fig. 3), and much larger and more distinct than the fusiform cells or nuclei which are mixed with the wavy fibres of an ovarian fibroma (fig. 5).

* Throughout this memoir I have endeavoured to avoid all comparisons, unless based on direct evidence gained by the examination of specimens. I regret that obvious reasons prevent me from supplying sketches of a large number of sections of normal uterine tissue during fœtal life, adult life, and pregnancy. All the comparisons between morbid and healthy structures are based on the careful inspection of numerous sections, of the kind just indicated, in my own collection, and in that of Dr. W. S. A. Griffith (p. 409).

† For a full account of the case see 'Trans. Path. Soc.,' vol. xxxviii, p. 245.

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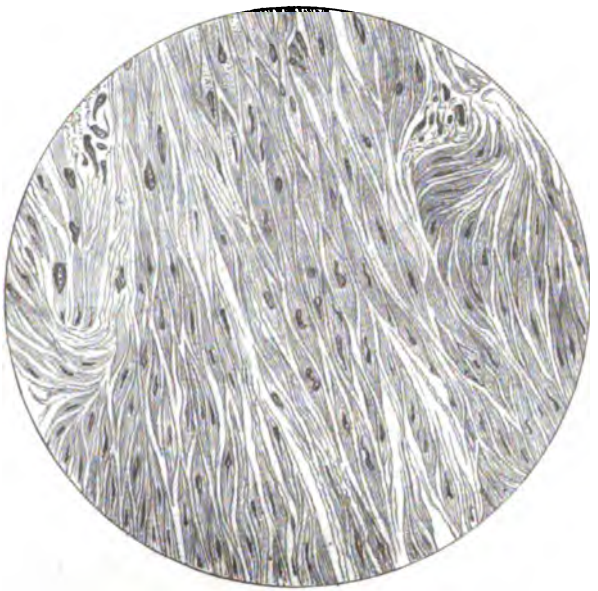

Myoma of a pregnant Uterus

Showing extreme hypertrophy of the muscle-cells

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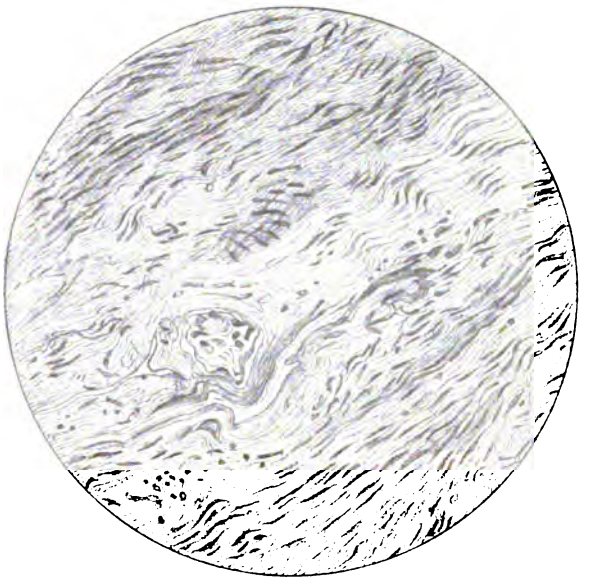

Fibro myoma of the Uterus

In some parts of the field the muscle-cells & the fibrous tissue lie separate, in others they are closely blended

West Newman & Co. Imp.

MYOMA OF THE PREGNANT UTERUS.—I am able to exhibit this evening a beautiful microscopical section of a myoma, removed, together with the entire uterus, at about the fourth month of pregnancy. Dr. Bantock was the operator, and the patient made a good recovery. The myoma was situated in the posterior wall of the uterus, bulging high upwards and far backwards. Its anterior and upper part was very soft and vascular, its posterior part was much firmer. From this firmer portion the section (fig. 3) was made. A uniform collection of large elongated cells covers the field. Each cell is flattened and tapers very gradually at each end to a long, fine point. The nuclei, which are deeply stained, resemble the cells in shape, some are very tortuous; in parts of the specimen whence fig. 3 was drawn I observed that the cells bore perfectly oval, though elongated, nuclei. In a section from the softer part of the same tumour the same large cells were found, but there were spaces filled with very fine connective tissue between the bundles of muscle-cells. I could not detect any bundles of well-formed white fibres, such as are seen in connective tissue in healthy structures, in tendons, and in fibromata.

The great size of the muscle-cells is the chief feature of interest in this case. They are not merely somewhat larger, they are far larger than the same cells in the walls of a pregnant uterus. I have recently compared the preparation above with some fine slides showing the muscular tissue of a uterus from a fatal case of Cæsarean section, and also with other slides showing the uterine tissue, from a case where death occurred from puerperal septicæmia on the tenth day after labour. All these preparations are in Dr. Griffith's collection. In none do I find any muscle-cells approaching in magnitude those depicted in fig. 3.

At the same time, the size of the muscle-cells, may, I think readily be explained. The tumour is muscular, like the uterine walls; the uterus had undergone the characteristic changes which occur in pregnancy, and the tumour had participated in those changes. The proportion between

the muscle-cells in the normal tissue and in the new growth was maintained in this case, that is to say the myoma cells were larger than the uterine tissue cells, as in non-pregnant cases. I do not think that there is sufficient reason to suppose that the tumour was sarcomatous in the sense implied by von Winiwarter in the fourth edition of Billroth's 'General Surgical Pathology and Therapeutics.'* The above explanation appears perfectly natural, nor had the tumour any of the clinical characters or physical appearances of what may be termed a semi-malignant fibroid, or of Pernice's racemose rhabdomyoma of the cervix.

FIBRO-MYOMA OF THE UTERUS.—By this term is implied a uterine tumour where groups of muscle-cells are blended with, or completely separated by, conspicuous tracts of fibrous tissue. A small amount of young connective tissue as seen in the uterus is never absent from a pure myoma; in fibro-myoma we see well-defined wavy bands of white fibre. Microscopically no two sections of fibro-myoma of the uterus look alike. Sometimes wide bands purely made up of muscle-cells predominate; sometimes the field is covered with white fibre, resembling that of which a fibroma of the ovary (fig. 5) is entirely composed. Lastly, the muscle-cells, or at least structures resembling them in size and appearance, may be intimately connected with the fibrils which make up the fibrous bands. This latter condition, well indicated in fig. 4, which represents a section of a pedunculated subperitoneal "fibroid," must be borne in mind. For in this case there can be no doubt of the uterine origin of the tumour and therefore practically no doubt about the presence of muscle-cells. In examining

* "One reason for distinguishing this tumour (uterine fibroid) from sarcomata is that, in the uterus, rapidly growing recurrent tumours develop, in whose older parts the structure of fibroma predominates, while the younger portions contain quantities of spindle-cells—true sarcoma cells. Clinically these tumours do not act like the much more frequent myomata, but like sarcomata. Some pathologists assume that in these cases there has been a development of a sarcoma in a fibroma; but it is more natural, from the predominance of the signs, to class these tumours as sarcomatous" (Dr. Hackley's Translation, 1884).

a solid tumour of an ovary, an organ which contains but few muscle-cells, we may come across a similar condition where large fusiform cells (differing from the specific "spindle-cell" of a sarcoma) are blended with fibrous tissue; in other words we can recognise what must fairly be considered as fibro-myoma.

Of all "fibroids" fibro-myoma is the commonest form, but I do not think that it is so frequent in proportion to pure myoma as is generally supposed. In many soft "fibroids" (as in the softer part of the myoma removed during pregnancy, already described) connective tissue abounds, but connective tissue is not fibrous tissue. When large, fibro-myomata are very tough; young, minute "fibroids" are usually, if not always, pure myomata with or without connective tissue; as that tissue, as well as pure white fibre, may readily undergo various kinds of degeneration, it is not easy to say whether myoma or fibro-myoma is the more likely to break down in parts or to calcify.

Fibro-sarcoma of the Uterus.—This disease does not come within the scope of this memoir as its sarcoma cells appear, according to all specimens which I have seen, to bear no resemblance to muscle-cells and to the small connective-tissue cells with which muscle-cells may be confused. Round-cells predominate and are generally large. The physical characters differ from those of the solid, tough tumours at present under consideration (see Museum of the Royal College of Surgeons, Path. Series, No. 4672). Still more different in character is the diffuse sarcoma of the endometrium. Gusserow (loc. cit.) devotes an important chapter to sarcoma of the uterus.*

Myoma of the Ovarian Ligament.—I have already described this ligament as a process of uterine tissue. A myoma in its substance (fig. 2) is practically a myoma of

* Pernice's rhabdomyoma of the cervix ("racemose myosarcoma strio-cellulare uteri") becomes truly sarcomatous when recurrent. The cells then appear very large and multiform, often bearing large nuclei. No trace of transverse striæ can be detected (loc. jam cit.).

the uterus. Two matters of importance are associated with the term "ovarian ligament." In the first place, it has been described as expressing a fold of peritoneum enclosing a few muscular fibres, when in reality it should signify a stout band of muscular fibres which forms a peritoneal fold, but that fold is not the ligament. Secondly, being made up of muscular fibres, it is natural for us to trace the destiny of the muscle-cells on the ovarian side, for their existence in the organ at the other end of the ovarian ligament, namely, the uterus, is evident. The ligament, I find, joins the parenchymatous part of the ovary (oöphoron) rather than the tissue of the hilum (paroöphoron). Do the structures so like muscle-cells which are found in the stroma of the ovarian parenchyma actually proceed from the uterus, or are those cells simultaneously developed along the ovarian ligament and in the organs at each of its extremities? I cannot find any account of the development of the ovarian ligament which would explain this point. The embryologists alone can solve the problem, which must be solved before we can draw trustworthy inferences from the study of ovarian histology.

MYOMA OF THE ROUND LIGAMENT is, again, a condition readily explained, when we remember that the ligament in question is a process of the uterus. Considering that the Fallopian tube is, morphologically, a part of the uterus and contains dense layers of muscular tissue in its walls, it is, perhaps, remarkable that we do not find authentic cases of MYOMA OF THE FALLOPIAN TUBE in the archives of pathology. Sir J. Y. Simpson's case of fibroid tumour of the Fallopian tube, of "a size equal to that of a child's head," has been repeatedly quoted. A glance at fig. 93 in his 'Clinical Lectures on the Diseases of Women,' 1872, p. 540, will show that the tumour which was attached to the upper aspect of the tube by a pedicle several inches long, could hardly have arisen from the walls of the tube, which appear perfectly normal. The tumour was no doubt developed in the reflexion of the broad ligament over the free border of the

tube. Cysts often appear in the same position (see "Broad Ligament Cysts above the Fallopian Tube," 'Trans. Path. Soc.,' vol. xxxvii, p. 348). Chiari has recently shown ("Zur pathologischen Anatomie des Eileiterkatarrhs" 'Prager Zeitschrift für Heilkunde,' vol. viii) that the nodules occasionally found at the uterine end of the tube* are not myomata, as others have supposed, but products of chronic tubal catarrh.

The possibility of MYOMA OF THE BROAD LIGAMENT is comprehensible, as there are layers of muscular tissue between the folds of that ligament which hypertrophy in some cases of intraligamentary tumours, cystic or solid. This hypertrophy accounts for the dull red colour of the surface of many intraligamentary tumours which causes them to look like uterine myomata, even when they happen to be thin-walled unilocular cysts. The relations of a tumour of this class must be accurately determined before it is written down as "myoma of the broad ligament." Some ovarian and uterine and all parovarian tumours burrow between the folds of the ligament, and certain cystic non-parovarian growths must likewise be excluded. Nevertheless I assisted Dr. Bantock, in the autumn of 1887 in removing two solid tumours which grew between the folds of the broad ligaments and appeared to be unconnected with the uterus or ovaries. The microscopical sections which I possess show abundance of white fibrous tissue, collections of muscle-cells and a homogeneous almost transparent matrix. I think that each tumour was a true fibro-myoma of the ovarian ligament resembling a soft uterine "fibroid," its peculiar appearance being the result of œdema. Mr. Bland

* These nodules have been discovered in cases of ectopic gestation, and reasonably suspected to be the cause of that pathological condition. Mr. Allport ("Extra-uterine Fœtation," 'Lancet,' vol. ii, 1845, p. 430) describes a case of rupture of a tubal cyst at the fifth month. "The right angle of the (uterine) cavity was obliterated, and we could not detect any orifice leading to the right Fallopian tube, which appeared to be impervious as far as the *sac*, at its junction with which lay a small fibrous tumour about the size of a horse-bean. A similar growth, as large as a nutmeg, was attached to the walls of the *sac*." The left tube was healthy.

Sutton, who also examined the tumours, believed that they were of the fibroma-molluscum type described by Virchow.

THE CONNECTIVE TISSUE OF THE OVARY.—The study of this subject is as difficult and complex as the study of the uterine tissue is relatively easy and simple. Industrious pathologists frequently start with erroneous opinions about the human ovary. At the medical schools, in France and Germany as well as in this country, the histology of the ovary is too often taught from specimens taken from the lower animals. We might as well teach human osteology from a kangaroo's skeleton. In a most important monograph,* Dr. Harz has demonstrated, by careful examination of the ovaries of many mammals, that the relation of the hilum tissue or paroöphoron, which bears ingrowths from the Wolffian ducts, to the follicle-bearing parenchyma, differs greatly even in mammals of the same order. Thus in the pig no ducts are found in any part of the ovary. In the guinea-pig, so often sacrificed on the altar of pathology, the ducts permeate the entire stroma; and so they do in the ovary of the American monkey *Cebus*, whilst the Wolffian epithelium is much less abundant in the stroma of another well-known American monkey, *Hapale*, the marmoset.

Yet the investigator's difficulties will not be at an end after a long and exclusive study of human ovaries. In the ovary of the human fœtus up to the third month, the connective tissue is almost inextricably mixed up with the primitive follicles and undergoes complex changes, described by Balfour† and Foulis,‡ in relation to the development of the follicles. These changes make it dangerous to draw comparisons between the very heterogeneous cells of

* "Beiträge zur Histologie des Ovariums der Saügethiere," 'Archiv für mikroskopische Anatomie,' Bd. xxii, 1883.

† "On the Structure and Development of the Vertebrate Ovary," 'Quart. Journ. Micros. Sci.,' vol. xviii, 1878.

‡ "The Development of the Ovary and the Structure of the Ova in Man and other Mammalia," 'Journ. of Anat. and Phys.,' vol. xiii, pt. 3, p. 353.

the ovarian stroma and the muscle-cells of the uterus in fœtal life. The muscle-cells in the uterine walls have almost acquired their adult form, as I have already stated. The ovarian connective tissue varies greatly in appearance from fœtal life up to puberty, as I find after the examination of a considerable number of children's ovaries. During active sexual life all kinds of imperfectly understood normal and pathological conditions may be present. The follicles and the muscular coats of the blood-vessels remain, as far as I can make out, the only constant histological elements. The follicles undergo numerous progressive and retrograde changes. By progressive changes I mean the formation of corpora lutea, and include the degeneration of those bodies, an extremely complicated subject not to the point in this memoir, for corpora lutea cannot develop muscle-cells. By retrograde changes of the follicles I refer to the degeneration of those which have never matured, and so never had the chance of becoming corpora lutea. Whole groups of follicles may degenerate before ripening.* In my opinion these groups may again develop, in a morbid direction, forming the true multilocular ovarian cyst, but I can find no evidence that they ever become myomata or fibromata. The cysts found in solid ovarian tumours bear no signs of follicular origin. The blood-vessels of the ovary are of more direct importance in relation to fibroma and myoma of the ovary. The arteries have very thick walls, with stout muscular coats. They may certainly become obliterated under various morbid influences, and then the fate of their muscle-cells must be taken into account. I have detected large fibres made up of muscle-cells in diseased ovaries, where the arrangement of the fibres left little doubt that they represented obliterated blood-vessels.

Patenko ("Ueber die Entwickelung der Corpora Fibrosa

* Janosik has found that in all ovaries an infinite number of follicles undergo atrophy, many beginning to decay during their earliest stages. The atrophic process varies considerably in individual follicles ('Sitzungsberichte d. kaiserl. Akad. d. Wissensch.,' vol. xcvi, pt. 3, 1888).

in Ovarien," 'Virchow's Archiv,' vol. lxxxiv, 1881) has satisfactorily shown that the curious little round fibrous bodies often found in ovaries at necropsies are of purely follicular origin. These "corpora fibrosa" represent sclerotic changes and never form fibromatous tumours. The arteries undergo sclerosis and in the course of their degenerations the muscular cells of the tunica media disappear through fatty metamorphosis and are replaced by granulation elements which simultaneously fill the adventitia. The white laminated bodies (*geschichtete Körper*) found amongst the sclerosed vessels are apparently of fibrinous intravascular origin. Patenko admits that fibromata cannot develop from his corpora fibrosa, and it is evident that myoma could not arise from them. Above all, they bear no resemblance, in any stage, to fibrous tissue.

Putting aside the follicles and the blood-vessels, the parenchyma must be considered. The paroöphoron or tissue of the hilum normally contains much true fibrous tissue, quite enough to account for fibroma of the ovary. Its Wolffian elements cannot give origin to that disease; they are epithelial bodies lining tubes and are the source of the papillomatous ovarian cyst which often burrows into the broad ligament. The normal character of the stroma of the parenchyma or ovary proper is hard to determine on account of the difficulty of distinguishing purely parenchymatous changes from the results of the degeneration of follicles and of blood-vessels. In the infant this stroma is very scanty. In ovaries from young women of eighteen or twenty great quantities of atrophied or degenerated follicles and corpora lutea are to be found. Nevertheless, there is a stroma of connective tissue, always rather "young" in character, with much homogeneous matrix. The fibres are scattered, never forming stout wavy bundles. I have never failed to detect bodies bearing all the appearances of muscle-cells. These bodies do not run in regular strands or fibrils, or if they do, they appear to proceed from the inner limits of the ovary as though they came from the uterus along the ovarian ligament. Sometimes these muscle-cell-like bodies

are intimately blended with the wavy bands of fibrous tissue in the parenchyma.

In the large succulent ovaries found in some cases of chronic oöphoritis, muscle-cells are often found in great abundance, as in two specimens in my own collection, but the evidence is strong that these cells represent obstructed vessels. Ovaries of this kind do not appear to become solid tumours; that they may develop into large cystic tumours is, I believe, more probable. A large fleshy ovary is very frequently discovered as the fellow of an ovarian cyst during ovariotomy.

From the above observations it may be seen that fibrous and muscular elements at least exist in the ovary, the former as a tissue, the latter rather as part of the vessels or as a continuation of the ovarian ligament. We have enough to account for fibromata and myomata of the ovary. I shall now turn to a consideration of tumours of those two classes.

Fibroma of the Ovary.—The existence of this tumour is almost universally admitted. Dr. Coe has written a valuable monograph on the subject.* I have examined microscopically at least three solid ovarian tumours which appeared as though entirely made up of white fibrous tissue, as well as many others where that tissue predominated, whilst cellular elements were also present in sufficient abundance to suggest sarcoma. The bilateral, firm, solid tumours of the ovary are generally sarcomatous and give rise to clinical symptoms of malignancy, such as ascites, before they attain large proportions (see Dr. Cullingworth's case, 'Trans. Obstet. Soc.,' vol. xxi, 1879, pp. 276, 314). Some of the small fibrous tumours of the ovary described in the Pathological Society's 'Transactions' and elsewhere were probably examples of the effects of chronic oöphoritis or of the abundant formation of corpora fibrosa, already noted. Few of these cases were true fibromata. I have given reasons why it is perfectly simple

* "Fibromata and Cysto-fibromata of the Ovary," 'Amer. Journ. of Obst.,' vol. xv, 1882, pp. 561, 858.

to show that fibromata of the ovary may arise independently of any similar uterine growth, as Dr. Coe has already proved. In none of the specimens which I have examined was there any uterine tumour.

A good example of a pure fibroma of the ovary was our President, Dr. John Williams' specimen; its microscopical characters were reported by Drs. Galabin and Herman and myself in the Society's 'Transactions,' vol. xxix, 1887, p. 513. Fig. 5 is a fine drawing, by Mr. Lewin, of a large fibroma of the ovary removed by Mr. Knowsley Thornton on July 16th, 1884, from a woman aged twenty. She had married when fifteen years of age and had borne no children. A very long abdominal incision had to be made before the tumour could be extracted. The pedicle was long and narrow; the relation of the tube and broad ligament proved clearly that the tumour was ovarian. The uterus was healthy, the opposite ovary small and infantile.*

The section drawn in fig. 5 was made for me by Dr. Vincent Harris in the Physiological Laboratory of St. Bartholomew's Hospital. Characteristic wavy bundles of true fibrous tissue abound; in other sections they were even more closely packed. Small, elongated, fusiform nuclei lie in the bundles of fibres, running invariably in the long axis of the fibres. Between the bundles, sparingly distributed, are small round-cells with oval nuclei such as are to be seen in fibromata in other structures. The sinuous bands of fibres contrast with the straighter rows of muscle-cells seen in myomata of the uterus.

The fusiform nuclei must be remembered, when this kind of tumour is compared with a myoma or a sarcoma of the ovary or uterus. They are certainly found in fibromata of other organs. Whether these nuclei may represent a type

* The after-history of this case, which Mr. Thornton has kindly obtained for me, is of great interest. Previous to the operation sexual desire appears to have been absent. The ovary which was left behind was found, as above stated, to be infantile. After recovery the instinct rapidly developed; the patient left her husband and bore a child to another man. Ultimately she returned to her home, and in February, 1888, she was in good health; there was no sign of return of the tumour.

5

Fibroma of the Ovary.

The bands of pure fibrous tissue bear small fusiform nuclei & include small cells with oval nuclei.

6

Sarcoma of the Ovary.

From a portion where much fibrous tissue was blended with spindle-cells.

West, Newman & Co. lith.

of tissue which has been or may become muscular fibre, is an important question. The small round-cells with oval nuclei seen in fig. 5 must be distinguished from bundles of fibres divided transversely. Their nuclei are too stout to represent fusiform nuclei divided in that direction. Mr. Lewin has taken care, as I can bear witness, to draw them accurately. These round-cells are very unlike muscle-cells. More consistently with the appearances of the cells in sarcoma of the ovary (fig. 6) and with modern pathological doctrines, they represent what, if they predominated universally over the fibres, would constitute a true sarcoma.

The tissue of this fibroma is much "older"* than the scanty fibrous tissue of a healthy ovary. Hence probably the greater frequency of sarcoma over fibroma in the ovary. We can understand why fibromata should grow from fibrous periosteum. But connective-tisssue tumours are usually of a younger type than the tissue of the structures whence they grew. Therefore from the ovarian stroma, where the connective tissue is normally almost embryonic, a sarcoma is more likely to develop than a fibroma. The fibrous tissue of true cancer of the ovary† must be kept out of consideration at present, as it is a new growth secondary to the cancer itself.

SARCOMA OF THE OVARY.—This disease must now be considered, as the question of the embryonic character of normal ovarian stroma has just been discussed in relation to fibroma. Only in respect to fibroma and leiomyoma need I enter into any description of ovarian sarcoma. I will put aside all those soft malignant ovarian tumours which on microscopical examination present the characters of round-celled, spindle-celled, mixed or alveolar sarcoma,

* Cornil and Ranvier ('Manual of Pathological Histology,' vol. i, second edition, English translation) state that "there are generally no elastic fibres in fibroma, the tissue appearing to be *the purest form of fibrous tissue*. This is an important point."

† I have figured a good specimen in 'Clinical and Pathological Observations on Tumours of the Ovary, Fallopian Tube, and Broad Ligament,' fig. 25, p. 103.

nor need I dwell on the pseudo-melanotic characters of slow-growing sarcomata self-stained through minute capillary hæmorrhages.* I shall confine myself to a consideration of the microscopical appearances of the least malignant form of sarcoma, where there is more than a trace of a fibrous stroma, so that I may demonstrate to what extent the sarcoma-cells amongst the fibres resemble the cells of old connective tissue or the true muscle-cells of a myoma. A spindle-celled sarcoma alone need be taken into account, for the other kinds of cell, just mentioned, are spindle-shaped, therefore they must be, in one respect, like one form of sarcoma cell. Once more, I must add that specimens of spindle-celled sarcoma where a trace at least of fibrous stroma is present are the most important. A pure spindle-celled sarcoma has none of the physical characters of a myoma or fibroma, but a sarcoma partially mixed up with fibrous tissue possesses all these characters.

I have shown a section from a tumour which caused the death of a patient under the care of Sir Spencer Wells in March, 1880. Malignant cachexia was marked, so that no operation was performed. The patient died on May 3rd, 1880. A soft mass replaced the left appendages and adhered to the fundus and body of the uterus. I examined it and found it to be a sarcoma of the left ovary. The greater portion of the tumour, including part of the section whence fig. 6 was drawn, was made up of large round-cells, closely mixed up with a scanty, delicate, fibrous stroma. This stroma formed trabeculæ enclosing round spaces which had no epithelial lining and the cells lay in the trabeculæ, not in the spaces. In other parts, however, most characteristic spindle-cells predominated. I have chosen a point where these spindle-cells are present, and blend with the fibrous stroma, (fig. 6). Fusiform cells with large oval or smaller fusiform nuclei are seen in abundance. These cells are intimately connected by their tapering extremities with the delicate fibrous stroma. Their arrangement suggests

* I have already explained why I deem it unnecessary to dwell on the subject of striated muscular tumours of the uterus.

homologies with the small round-cells seen between the bundles of fibres in the fibroma of the ovary (fig. 5). On the other hand, if compared with any of the drawings of myomata, it will be seen at a glance that there is no close resemblance between a spindle-cell from a sarcoma and a muscle-cell. In fact, fig. 6 represents young connective tissue from a tumour mostly made up of even younger tissue. Each cell is oat-shaped rather than fusiform, and its nucleus is either oat-shaped or almost spherical. The muscle-cell is more truly fusiform, and its nucleus is either staff-shaped or else forms a very elongated oval body.

Fibro-myoma of the Ovary.—The existence of a pure myoma of the ovary is very doubtful, but I believe that fibro-myoma of that organ is not rare. I have already spoken of the sources of muscular fibre in the normal ovary. Whether there be muscle-cells diffused over the stroma of the ovary, or whether the only muscle-cells found within the limits of the ovary be those forming the middle coat of the arteries or those which represent the ovarian extremity of the ovarian ligament, matters little, when we consider the suspected tumour itself. These questions, already discussed in this memoir, concern its origin rather than its structure. Rhabdomyoma or striped myo-sarcoma may develop in connection with the kidneys, where there is naturally no striped muscular tissue; Cohnheim considers that the new growth is teratological in this case, and the question is fully considered in Mr. F. S. Eve's paper on "Specimens of Tumours composed of Striped Muscle and Sarcoma Tissue (Striped Myo-sarcoma), connected with the Kidneys" ('Trans. Path. Soc.,' vol. xxxiii, 1882, p. 312). There is no need to resort to teratology in the case of fibro-myoma of the ovary. The tissues of which the tumour is made up exist in the organ which it attacks.

Putting aside a case which I have already reported ("Clinical and Pathological Observations on Tumours of the Ovary," p. 97), and a second case where a fibro-cystic tumour proved on microscopical examination to be fibro-myomatous, but where there was a little doubt about its

ovarian origin ('Trans. Obstet. Soc.,' vol. xxix, p. 513), I come to an apparently undoubted specimen of fibro-myoma of the ovary. The tumour was removed by Mr. Meredith from a woman aged forty who had dysmenorrhœa for a year, without any definite symptoms of ovarian disease. The duration of the growth was quite uncertain and the patient was in good health a year after its removal. The specimen is preserved in the museum of St. Bartholomew's Hospital, Path. Ser., No. 2925 *a*. It is an oblong tumour, measuring about four inches in its long diameter; the relations of the tube and broad ligament leave no doubt that the tumour replaces the ovary. In the museum catalogue it is stated, quite incorrectly in my opinion, that "the structure of the tumour is exactly similar to that of a normal ovary, closely resembling a spindle-celled sarcoma."

I was not aware that a normal ovary closely resembled a spindle-celled sarcoma, and the structure of this tumour is very dissimilar to that of a normal ovary. Some or all of its histological elements no doubt exist in the ovary, but not arranged in the same fashion. Fig. 7 is drawn from a section of the tumour kindly lent to me by Dr. Griffith. A stroma of wavy fibrous tissue is conspicuous. Intimately blended with the wavy fibres are cells with elongated nuclei. They bear all the characters of muscle-cells. They are much larger than the nuclei in the fibroma of the ovary (fig. 5) and are not of the form and arrangement of the sarcoma cells in fig. 6. I see no reason why they should not be considered as muscle-cells. They are arranged precisely like muscle-cells in a fibro-myoma of the uterus (fig. 4). Those who object and say that the cells in fig. 7 are not muscle-cells but cells of the same form must take the responsibility of proving from wider evidence that there are plain muscle-cells and fusiform bodies of precisely the same appearance which are not muscle-cells.

The sarcoma-cells in fig. 6 and the connective-tissue nuclei in fig. 5 are, as these drawings show, not identical with the cells in fig. 7, which cells most resemble those of

Fibro-myoma of the Ovary.

Structures precisely resembling the muscle-cells in Fig. 4 (fibro-myoma of the uterus) are mixed with bands of fibrous tissue.

West, Newman & Co lith.

plain muscular tissue. At the same time, all three varieties of cell agree in one character. They are closely connected with the fibrils of the stroma. In this they show a common connective-tissue origin, which nobody will dispute in the case of the fibroma and sarcoma and few would reject in the case of the myoma.

We may conclude then, that a careful study of the histological features of uterine "fibroids" and of certain innocent solid tumours of the ovary teaches us that, however rare, fibroma and fibro-myoma of the ovary are not unknown, and that according to the light of general pathology, and the comparison of the known with the uncertain, muscle-cells, the fusiform cells of fibrous tissue and the specific spindle-cells of a sarcoma may, in many cases, be distinguished from each other.

Dr. HERMAN would be glad if Mr. Doran would define his views as to the statement he had quoted from Gusserow, namely, that the circumscribed encapsuled "fibroids" were usually myomata, while the concentric enlargements of the whole uterus were fibromata.

Dr. HORROCKS considered that Mr. Doran had valiantly attacked a difficult subject in a very able and scientific manner, and that if he could show a way that would lead to the possibility of distinguishing the differences between myomata (involuntary or unstriated fibre), fibromata, spindle-celled sarcomata, and inflammatory products, the thanks of not only the Obstetrical Society but of the whole profession would be due to him. It was not typical examples of each of these structures about which there was a difficulty; it was the mixed cases or the unusual ones where doubts arose, and then it became of the greatest importance to be able to distinguish one from another. Mr. Doran had endeavoured to do this, and had mentioned two points, namely, that the fibres in myomata were larger than those of fibromata and sarcomata, and that the nuclei were different in shape. Looking at figs. 5, 6, and 7, he (Dr. Horrocks) could not see that this distinction held good, for some of the fibres represented in fig. 5, at the upper and left side, might be easily mistaken for muscular fibres, and were very like some of those in figs. 6 and 7. One point he referred to was the general arrangement of the structures. Dr. Horrocks thought that, whilst the individual elements in these patholo-

gical growths might be alike, yet their arrangement in the growth might be different. And so if a section right across was obtained we might be able to come to a correct conclusion.

Dr. GRIFFITH expressed the opinion that Mr. Doran's paper was one of the most valuable of his contributions on pathological questions. From the mass of detail contained in it arose the most important question, Can the histologist determine in any given case as to the malignancy or non-malignancy of a solid tumour of the ovary?—the question as to whether a tumour is a fibroma or myo-fibroma being subordinate but of great interest. Now, the first practical difficulty in determining the nature of any solid ovarian tumour of doubtful character arises, as Mr. Doran pointed out, from the peculiar structure of the stroma of the fully-developed ovary. If a portion of normal healthy ovarian stroma, free from Graafian follicles or their remains, was submitted to an experienced pathologist, he would frequently say spindle-celled sarcoma. This arose from the fact that the mass of the stroma consists of pure spindle-celled structures, fully-developed fibrous tissue being scanty, and seen chiefly at the periphery of the ovary. As a consequence of this, almost every solid tumour developed from the stroma of the ovary consists largely of these cells, and hence the importance of determining their nature. As regards this point he differed from Mr. Doran, believing that the mass of the spindle-celled stroma of the ovary is modified connective tissue and not muscular, and in support of this view he would ask Mr. Doran if he had any difficulty in distinguishing in a section of the outer part of the uterine wall between the muscular and connective-tissue elements. He would say none. Again, if Mr. Doran held that the ovary was in the main a muscular organ, he had not suggested any reason for or utility of this. Dr. Griffith fully admitted the difficulty of distinguishing the histological elements of a spindle-celled fibroma from a spindle-celled sarcoma of the ovary, but when the general characters and clinical history of each is taken into consideration, the difficulty of determining the character would be greatly diminished; in the one case the tumour is of slow growth, firm, well-circumscribed, with little tendency to form adhesions with neighbouring structures and with none to invade them, but often accompanied with ascites; in the other the tumour increases more rapidly, is less firm and often soft, soon forming adhesions and invading neighbouring organs; ascites is almost invariably present.

Mr. ALBAN DORAN, in reply to Dr. Herman, maintained that Gusserow's aphorism on myoma and fibroma of the uterus was not of deep scientific value. Mr. Doran had found that the minute circumscribed encapsuled interstitial "fibroid," probably the earliest stage of all "fibroids," was a pure or almost

pure myoma. When induration of interstitial connective tissue complicated the development of myoma, a fibro-myoma, said Gusserow, was the consequence, but this was only what might be expected. Dr. Horrocks doubted that myoma cells, connective-tissue cells, and spindle-cells of sarcoma could be distinguished when there was doubt, in other respects, about the nature of a tumour. Bnt Mr. Doran had based his memoir on the fact that in certain cases there was no doubt about the cells, and had not denied that in others every kind of transitional feature could be traced. Dr. Horrocks stated that the cells mixed with the fibres in the upper part of fig. 5 closely resembled cells, represented as muscle-cells, in the upper part of fig. 7. The latter, however, were at least double the size of the former, and identical in appearance with the muscle-cells in the upper part of fig. 4, the section of an undoubted fibro-myoma uteri. Mr. Doran admitted that the intricate arrangement of cells and fibres was puzzling to all who studied myomata and fibromata. For that reason he had sketched those portions of the sections where the cells and fibres ran more or less in the same direction, and where there were no bundles of fibres cut across transversely. Dr. Griffith had found that when a general pathologist looked at the connective tissue of a normal ovary through the microscope he mistook the specimen for a spindle-celled sarcoma. The error was not surprising, for men must make mistakes when they give judgments on what they know little about, and many good pathologists have not received a sound education in the histology of healthy structures. Mr. Doran maintained his opinion that the normal character of the connective tissue of the adult ovary was unknown or imperfectly understood. Dr. Griffith's cases, where loose connective tissue with fusiform cells prevailed, were probably abnormal. Ovaries with such characters were probably œdematous, a common condition when there was cystic disease on the opposite side or fibro-myoma of the uterus. In the ovary of a healthy young married woman who had borne several children the connective tissue did not appear to be abundant, and it was crowded with degenerate follicles, cicatrices of corpora lutea, and other structures not so easily distinguished. Mr. Doran had never asserted that the ovary was, in the main, a muscular organ. He had simply insisted that muscular cells could be found in its parenchyma and could be traced to two sources, the ovarian vessels and the ovarian ligament. Mr. Doran had dwelt on the malignancy of sarcoma of the ovary, noting Dr. Cullingworth's case, and had proved that, on the unedifying evidence of Mr. Thornton's case, a large fibroma might be clinically innocent. He agreed with Dr. Griffith that certain ovarian tumours appeared to represent hyperplasia of the stroma rather than sarcoma. He warned pathologists against theories about embryonic tissue

lying latent during childhood till it suddenly developed into a tumour of a relatively innocent type in adult life. A specimen which he had exhibited at the Pathological Society on October 16th tended to prove that arrest of histological development more probably caused the immediate formation of a very malignant tumour, which destroyed life before or very shortly after birth.

ON LOCKING, RETROVERSION, AND STRANGULATION OF UTERINE FIBROIDS IN THE PELVIC EXCAVATION.

By J. Matthews Duncan, M.D.

(Received March 15th, 1888.)

(*Abstract.*)

Locking in the pelvic excavation implies impaction not the result of adhesions. Its effects may be produced by pressure into the pelvic brim of a tumour too large to pass into the excavation.

Retroversion of a fibroid closely resembles the retroversion of the gravid uterus in its characteristic form. The symptoms and treatment of the two conditions are nearly alike.

Strangulation, with locking, of a fibroid, with or without retroversion, is a rare accident. A case is described. Dr. Matthews Duncan had not seen a similar case of strangulation of or by a retroverted gravid uterus.

A uterine fibroid may be, in a certain sense, locked or incarcerated in the pelvic excavation by adhesions, but to such a condition I make no reference in this paper.

Locking naturally suggests injurious pressure, and this whether there is retroversion or not, for locking implies such size as renders displacement upwards, through the brim, into the general cavity of the abdomen, difficult if not impossible. But there may be incarceration or locking without any evidence of injurious pressure, and I have seen many examples. Again, cases are not very rare where

there is injurious or even fatal pressure without any locking, the tumour not being enclosed within the pelvic excavation; in such cases the fibroid, well adapted in shape to the pelvic brim on which it rests, may exert dangerous pressure on the ureters, the bowel, the bladder or urethra.

Locking is generally discovered on examining to find explanation of pelvic suffering, or of retention of urine, or of other symptoms which may arise from the pressure of a fibroid. The most striking condition is retention of urine, and it demands treatment by catheter. That this retention is the result of pressure is made almost certain by its increased frequency before the advent of, or during, menstruation; as Hardie* and others have shown. But researches are still needed to discover the relation of this retention to the position of the fibroid in the uterus, irrespective of its position in the pelvis. The swelling of a fibroid before menstruation begins may have different results according to its situation.

Locking is ascertained by finding a tumour which fills the pelvis, and can be elevated into the general abdominal cavity with difficulty or not at all. Locking may affect a lower lobe of a fibroid or the lower of two or more fibroids.

I have met with many cases of locked fibroid, but I have rarely found elevation successful. Of course, it will be easy, but fail in giving relief on account of relapsing if the tumour is not large enough to be stable on the brim of the pelvis, slipping down through it again into the excavation. When it is successful it gives relief as I have recently at least four times observed. It is effected just as reposition of the retroverted gravid uterus is brought about. A locked fibroid may cease to cause retention of urine, or the bladder may regain or acquire expulsive power while incarceration persists. A fibroid though locked may find its way gradually into the abdomen as it increases in size. As in retroverted gravid uterus, reposition is generally effected at a sitting if effected at all; sometimes it is

* 'Edinburgh Medical Journal,' January, 1874.

more slowly effected; often it occurs spontaneously if urine is not retained.

Replacement or elevation of a fibroid, whether simply locked or retroverted and locked, may be prevented by pelvic and other adhesions. But considerable or even complete replacement may, in some cases, be effected while there are adhesions; and I believe that, in such cases, there is generally recurrence of the condition for which replacement was tried.

Variety in shape and multiplicity render retroversion of a fibroid a less uniform and simple affection than the retroversion of the gravid uterus; but the two accidents have much in common. Each can occur as an urgent condition only within certain limits of size; each may be the result of a sudden displacement or may be gradually prepared, being brought to urgency by retention of urine; each involves similar dangers, and each is treated according to the same principles.

I have seen many cases of uterine fibroid where the cervix uteri was high behind the symphysis pubis, and reached with difficulty by a finger pressed between it and the tumour; but I have seen few cases of retroversion.

Mrs. H—, aged 38, was admitted into St. Bartholomew's Hospital on December 31st, 1887. She was married at twenty-two, and had two children, of which the last was born twelve years ago. She has been a widow twelve years. Menstruation began at thirteen, and she has been always regular, the loss not excessive. The last two periods have been scanty, and she last menstruated three weeks before admission. Two months ago she began to have pain in lower abdomen and difficulty in passing water. The abdomen became swollen and the bowels constipated. For three weeks her medical man has drawn off her water, but only every second day. No water was passed between the catheterisations, and she suffered much pain and distension. She continued her work till fourteen days before admission.

On admission, the urine was ammoniacal and tinged with

blood. The abdomen uniformly distended. In the hypogastric and adjacent part of right iliac region is to be felt a rounded hard mass, with a projection into the lower part of the umbilical region. The pelvic excavation is occupied by a hard rounded mass which, bimanually, is found to have solidarity with the hypogastric tumour. The cervix is so elevated behind the symphysis as not to be reached by the finger. The tumour is displaceable upwards to a small extent, and appears to maintain its partial elevation.

She now began to pass water naturally, and continued to do so. She was, twice daily, kept for nearly two hours in a genupectoral position, and Dr. Davenport made, repeatedly, pressure on the tumour with two fingers, *per vaginam*, in the direction of the axis of the brim. On January 4th the cervix was found by Dr. Davenport in its natural situation, or rather in the hollow of the sacrum, and the pelvic excavation empty of tumour. The hypogastric and adjacent parts of iliac and lumbar regions, and of the umbilical region as high as the navel, were occupied now by a rounded, lobed, hard, mobile tumour.

The patient expressed herself as feeling quite well, and was dismissed on January 18th, 1888.

Strangulation of a uterine fibroid or by a uterine fibroid is a rare accident of which I have seen one good example, and of which I remember no other. In this case, which I shall relate, strangulation was combined with retroversion of the fibroid, and cure was effected partly, if not chiefly, by replacement of the retroverted fibroid.

Reflecting on the case one naturally recurs to the analogy of the retroversion of the gravid uterus; but though that condition is comparatively common, there is, at least rarely, probably never, strangulation. I do not remember having seen a retroverted gravid uterus with strangulation. In retroversion the gravid uterus may well fill the pelvic excavation, and be pressed down far towards the perinæum, but there is no strangulation. There is not a congested bulging swollen perinæum, nor a swollen rectum and vagina;

and the very alarming general or constitutional condition accompanying strangulation is absent. Or, if alarming constitutional symptoms are present, they do not closely resemble those of strangulation. They own a different cause, namely, sloughing and ulceration of the bladder, and perhaps also pericystitis or more general peritonitis, and they have the general characters of inflammation and septicæmia.

The gravid uterus is, when compared with a uterine fibroid, a soft body, and not fitted to take part in the process of strangulation as a fibroid does, though it is quite conceivable that it might do so. The fœtal head, in its passage during labour through the pelvic excavation, may be merely arrested, or arrested and at the same time impacted; and when this latter condition occurs it may soon induce a state of strangulation of the maternal structures, its shape and size fitting it for this evil function.

Though the history of the following case does not make it indisputable that sudden retroversion was the first step towards strangulation, yet that is the natural interpretation of the events as given in the narrative. The retroversion led to congestion and swelling of the fibroid; then came retention of urine, an evil in itself, and aggravating the retroversion and the swelling; and so at last came the strangulation.

Mrs. B—, aged 31, was admitted into St. Bartholomew's Hospital on November 7th, 1884. She had been twice married, and had had six children, of which the last was born two years previously; she had had two miscarriages, of which the last, at two and a half months, occurred two months before admission. She has menstruated since fifteen, and regularly. She has enjoyed good health. She says she has had descent of the womb since her first labour seventeen years ago and procidentia for six years, and has worn a pessary.

At her last miscarriage, two and half months ago, there was considerable loss of blood, which continued for a week.

Four weeks ago she had diarrhœa with much straining and tenesmus. This was followed by considerable uterine hæmorrhage for four days. Defæcation became painful. A pessary was worn. Four days before admission she walked to see her physician and was then tolerably well; but after returning home great pains, like labour pains, came on in the hypogastric region, and the pessary was expelled; and now the urine was retained, the rectum prolapsed, the bowels ceased to move, bloody discharge flowed from the vagina.

On admission, she has a look of severe illness, the face pale and dusky and pinched; the tongue furred and having many prominent red papillæ; pulse 108, small and hard; morning temperature 102·2°, at night 104°. Urine 1026, with trace of albumen. The abdomen is distended, tense, and tympanitic, tender on pressure below the level of the umbilicus; and there is pain in the sacral region. The rectum is largely prolapsed and covered with gelatinous mucus, and concealing the anus are two large, adjacent, œdematous piles. The finger introduced into the rectum finds no fæces, its cavity filled with swollen mucous membrane—chemosis. Blood-stained discharge flows from the vagina. The finger introduced finds it swollen like the rectum, and pressed up behind the symphysis reaches the cervix at its upper margin. The whole pelvic excavation is occupied by a dense, hard, tender, rounded mass. The whole anoperineal region, including the pudendum, is tender, congested, œdematous, and largely bulging downwards.

The tumour was pressed forwards and upwards in the direction of the axis of the brim, and was moved in an appreciable degree. The bowels were successfully forced by castor-oil. The woman was supported repeatedly and for long periods in the genupectoral position.

In twenty-four hours there was a distinct improvement in the woman's appearance and symptoms; and she declared herself relieved. She passed her urine spontaneously. The tumour continued to recede gradually from the pelvic

excavation as well as to diminish very greatly in bulk. Discharge from rectum and vagina began to lessen. The rectal procidentia had retreated.

A week after admission the woman was well; the swelling and œdema of the anoperineal region gone; the cervix uteri in its natural situation; the fibroid just reached by the finger, imperfectly felt bimanually, of the size of a small fœtal head. After four weeks' residence she left the hospital.

[For discussion see p. 447.]

A CASE OF LOCKED FIBROID TREATED BY SUPRAVAGINAL HYSTERECTOMY.

By W. A. MEREDITH, M.B., C.M.

(Received July 30th, 1888.)

(*Abstract.*)

A SINGLE woman, aged 36, was admitted under Dr. Boulton into the Samaritan Free Hospital in May, 1888, suffering from a uterine tumour, which was firmly impacted in the pelvic cavity. The pressure of the growth on the neck of the bladder had during the previous nine months led to frequent attacks of complete retention, of which the recurrence had latterly been avoided only by relieving the bladder at regular intervals of not less than two hours both by night and by day.

After several unsuccessful attempts to dislodge the tumour from the pelvis by means of vaginal taxis, the case was transferred to Mr. Meredith's care with a view to abdominal section. At the operation, performed by him on June 2nd, considerable difficulty was experienced in extracting the impacted mass, which, together with the uterine body and its appendages, was subsequently removed by a supravaginal hysterectomy. The tumour, weighing 2 lbs., was of the size of a large cocoanut, and consisted of a densely packed mass of fibro-myomatous growths developed in the posterior wall of the uterus. The after-progress of the case was uninterrupted, and the patient made an excellent recovery, leaving the hospital exactly six weeks from the day of operation with the abdominal incision soundly healed throughout.

E. N—, aged 36, single, was admitted under Dr. Boulton into the Samaritan Free Hospital on May 19th, 1888, suffering from a pelvic tumour.

The following history was obtained from the patient:— Menstruation began at the age of thirteen, was always regular and never excessive in amount, usually lasting from three to four days. For nine months previous to her admission the patient had suffered from pelvic pains, accompanied by increasing difficulty in micturition, which on several occasions had led to complete retention, requiring relief by means of the catheter. In October, 1887, she entered the Hastings and St. Leonards Infirmary, where she remained for five weeks, being subsequently sent to a convalescent home. No improvement took place in her symptoms, however, and it was then discovered that she had a pelvic tumour. Meantime the bladder trouble steadily increased, leading to recurring attacks of retention, unless urine were voided at intervals of not less than two hours both by night and by day. This state of things so interfered with her rest, and with her work as a domestic servant, that she found herself quite incapacitated from earning her livelihood, and was consequently most anxious for relief.

On vaginal exploration the pelvis was found completely blocked by a very firm globular tumour, extending downwards to within two inches of the outlet, and evidently continuous with a somewhat irregular mass felt in the abdomen above the pubes. The cervix uteri, situated high up in front, immediately behind the pubic symphysis, was soft and very much shortened; the sound passed fully five inches upwards and then backwards, over the anterior surface of the tumour, which was evidently closely incorporated with the body of the uterus.

The case was diagnosed as one of interstitial fibromyoma uteri impacted in the pelvis, and on May 22nd, after the bowels had been well moved, an unsuccessful attempt to push the tumour upwards into the abdominal cavity was made by Dr. Boulton, while the patient was in the genu-pectoral position.

A second trial, three days later, proved equally unsuccessful, and on May 28th the patient was seen in consulta-

tion with Mr. Meredith, when a further prolonged attempt at reduction failed completely in raising the pelvic mass.

As there seemed no likelihood of obtaining better results by means of hydrostatic pressure applied *per rectum*, while further taxis was open to the serious risk of setting up inflammatory or other troubles, and as, moreover—in view of the patient's age—there was good reason to believe that the tumour, even though released from the pelvis, would continue to grow in the abdominal cavity and ultimately require surgical interference; it was finally decided that abdominal section should be performed with a view to hysterectomy, and the case was accordingly transferred to Mr. Meredith's care.

The following are the details of the operation performed by him on June 2nd:—On opening the abdomen the bladder and uterus were found drawn up over the front and upper surface of the tumour, which completely filled the pelvic cavity, and appeared to be immovably fixed. A stout corkscrew was inserted deeply into the upper portion of the growth as far back as possible, and efforts were thus made to raise it from the pelvis. These resulted in some amount of forward rotation of the mass, but no real advance was gained until a second corkscrew had been introduced some two inches behind the first one, when by the exertion of very forcible traction the tumour was finally dislodged and brought into view. The right ovary and tube were now seen to be easily removable, but the appendages on the left side were still firmly held down, owing to the extreme tension of the corresponding broad ligament, which was stretched across the surface of the tumour, and prevented its complete extraction. This was not effected until the free border of the ligament had been clamped, and divided to an extent sufficient to allow of some degree of enucleation of the growth on that side.

The cervix uteri was next encircled by a *serre-nœud* wire, which included both the appendages, and passed well below the base of the tumour behind; in front it was found necessary to dissect down the fundus of the bladder for

more than an inch from the anterior wall of the uterus, in order to avoid its inclusion in the loop. This latter was now secured and tightened by means of the screw, and the cervix was transfixed by a stout steel pin immediately above the constricting wire.

The uterine body with its appendages was then cut away, and the edges of the peritoneal investment of the remaining stump were drawn together across its surface by means of a laced suture of stout silk.

The margins of the parietal peritoneum having been carefully adjusted around the stump, were next united immediately above it by a silk suture, which also included the serous covering of the cervix just below the groove formed by the constricting wire; this suture was firmly tied, and cut short. The abdominal incision was then closed with stitches of silkworm gut.

Finally, the uterine stump, after being lightly dusted with iodoform, was packed round with strips of plain absorbent gauze, and the abdomen was covered with a pad of iodoform wool secured by strapping and a flannel bandage.

The parts removed weighed exactly 2 lbs. The tumour, equal in size to a large cocoanut, consisted of a very firm and densely-packed mass of fibromyomatous growths developed in the posterior wall of the uterus. The left ovary and tube were normal. The right ovary was cystic, and enlarged to more than twice its natural size; the corresponding tube was elongated and irregularly distended; the broad ligament contained a simple cyst of the size of a pigeon's egg.

The after-progress of the case was uneventful. The highest temperature (101·6°) was reached on the second day, when a thickly clustered crop of sudamina made its appearance, and shortly assumed a pustular character on the chest and abdomen. Coincidentally with its full development, both pulse and temperature began to fall, becoming normal on the fifth day, and thenceforward remaining so.

The bowels were moved by enema on the sixth day, and the dressings were changed for the first time on the following morning, when the stump was trimmed and re-covered as before.

On the ninth day the *serre-nœud* was withdrawn after division of the wire, and this latter, together with the transfixing pin, was removed twenty-four hours later, when the abdominal sutures were also taken out.

Thenceforward the stump cavity was dressed daily, and portions of slough were removed whenever possible, the last of them coming away on the eighteenth day. The patient was allowed up for the first time on the thirty-first day, and she finally left the hospital on July 14th, exactly six weeks from the date of operation, with the abdominal incision soundly healed throughout.

Remarks by Mr. MEREDITH.—The case appears to be of interest mainly from two points of view, firstly, with regard to the cause and nature of the impaction; and secondly, in connection with the question of the treatment adopted.

As to the cause and nature of the impaction, its occurrence would seem to have been due to the fact of the development of the growth in the posterior wall of the uterus having originally led to a retroversion of this organ. Such displacement was in time corrected by the increasing bulk of the tumour, which had, however, meanwhile so accommodated itself to the posterior curve of the pelvic cavity as to become incarcerated below the level of the sacral promontory, while displacing both uterus and bladder upwards from the true pelvis. The urgency of the symptoms caused by the resulting pressure upon the neck of the bladder afforded ample justification for active interference with a view to affording relief.

In the second place, with regard to the question of treatment, two courses are open to us in dealing with cases of so-called "locked" fibroid.

The first of these, aiming at the upward dislodgement of the impacted mass by non-operative means, should always

be first resorted to, as likely to prove successful in the majority of instances in so far as regards immediate relief from injurious pressure symptoms. The object in view may be attained by means of vaginal taxis, while the patient is in the genu-pectoral position; or, more surely, by the employment of hydrostatic pressure applied *per rectum* by the gradual distension of a rubber bag. Either one of these methods, judiciously employed, may prove successful; and one or both should invariably be tried before more serious steps are advocated. At the same time, however, it must not be forgotten that such treatment, if roughly carried out, may induce serious consequences by causing inflammation in or around the tumour; and it is therefore well to avoid unduly persisting in its use, should no results be obtained by a thorough trial.

In the case under consideration, resort to hydrostatic pressure after the failure of vaginal taxis, seemed inadvisable for the reasons already stated; and the alternative course of treatment above referred to, viz. abdominal section, was therefore adopted, a decision which was fully justified by the state of things subsequently met with at the operation. The unusual amount of difficulty then experienced in raising the firmly impacted tumour, while due partly to the dense unyielding nature of the growth, was also to some extent accounted for by its relation to the broad ligament on the left side; and it was clearly seen that no amount of pressure from below could have possibly succeeded in completely dislodging the mass from the pelvic cavity.

The question of removal of the uterine appendages as opposed to that of supra-vaginal hysterectomy here required no consideration, since the former procedure was rendered impossible by the extreme tension of the left broad ligament; and I therefore adopted the more radical course as the only one open to me under the circumstances.

Dr. Gervis drew attention to the usefulness of a suitable pessary in preventing a recurrence of the downward displace-

ment of a fibroid after it had been pushed up out of the pelvic cavity. He also expressed himself as much satisfied with the results of hydrostatic pressure in cases where the taxis had failed, and gave some particulars of a case in his own practice resembling Mr. Meredith's, in which he had had to perform supravaginal hysterectomy for a case of large fibroid tightly impacted in the pelvis, and in which, after its removal, the tumour had proved to be centrally in a state of commencing necrosis.

Dr. Graily Hewitt had found many of the cases of suffering due to impaction of uterine fibroids were relievable by upward pressure and properly-adapted vaginal support. Cases differed very much. He mentioned a case where the pelvis seemed completely packed with an enlarged fibroid uterus, but the patient had only recently complained of difficulty in micturition, whereas in other cases a small tumour might occasion much discomfort. In one very marked case a fibroid growth at back of uterus occasioned sudden impaction with retroversion, and enormous distension of the bladder occurred. He thought cases of anteversion with hypertrophy of uterus were sometimes mistaken for fibroids, and mentioned a case where for several years the patient suffered severely, and was thought to have a tumour. This case was cured a few months after a proper diagnosis was made and the case appropriately treated. Another case, where an egg-sized tumour grew anteriorly, a little to the right side, a well adjusted pessary was very successfully used, and the tumour raised out of the brim, where its pressure had rendered the patient a complete invalid.

Dr. Lewers referred to a case he had seen, where a uterus retroverted by fibroids caused retention of urine in a woman aged 49. In this case, after drawing off the urine, the uterus was replaced bimanually, and a large ring pessary inserted. This was two months ago; he had seen the case recently, and the uterus had remained in good position, the patient having no trouble with her water. Dr. Lewers mentioned this case because he gathered from Dr. Duncan's paper that in such cases replacement, even when possible, was usually followed by recurrence of the malposition.

Dr. Aust Lawrence stated that he had, on three occasions, found that after keeping a patient in bed in the semi-prone position for twenty-four hours, he was able to push up out of the pelvis, in one case a retroflexed gravid uterus, and in two other cases "locked fibroids," which had resisted all his efforts at replacement prior to sending the patients to bed. Dr. Lawrence strongly deprecated repeated attempts at replacement without first of all trying the effect of posture as used in his cases.

Dr. Champneys said that, while Mr. Meredith was to be con-

gratulated on the success of his operation, he did not think he had proved that the tumour was irreducible, for he had not tried hydrostatic pressure exerted by gravitation. This, in Dr. Champneys' hands, had succeeded where taxis had failed, and he always used it after a persistent trial of taxis has failed, before proceeding further. The mode of using it he had published in the 'Lancet' some years back. It was most conveniently applied by a child's air-ball connected with an irrigator. Any desired amount of pressure could be applied and removed at will, and the force thus applied was continuous and even. A fibroid might be impacted for many reasons, such as bulk, œdema, adhesions, and expansion of the broad ligaments. Besides these there is the obstacle to replacement arising from air-tight adaptation; on raising the tumour after abdominal section, a loud sucking noise was often heard as the tumour was lifted. Hydrostatic pressure got rid of some of the œdema, adhesions would not be rudely torn as by taxis, and the broad ligaments would be unaffected; thus it furnished a valuable differential prognosis as to the possibility of replacement. He did not say the tumour was replaceable in Mr. Meredith's case, but he should himself have tried hydrostatic pressure before resorting to abdominal section.

Dr. PRIESTLEY said he thought the most useful lesson to be derived from Dr. Duncan's paper was the great value of persistent taxis in remedying such cases of impaction. Whether the pressure was made with the fingers or with hydrostatic bags as Dr. Champneys had suggested, and aided by the genupectoral position, in either case Dr. Duncan's instances had proved that most difficult cases might be overcome in this way if pressure in the right direction was employed sufficiently long and persistently. From what had been said in the discussion it might be inferred that cases of absolute impaction of fibroids were frequent, while he believed all those who had experience in diseases of women would concur in saying that they were comparatively rare. The symptoms produced by pressure, almost amounting to impaction, were more frequent, and these were, retention of urine in some cases, in others incontinence of urine. He had seen a patient recently who, with a large fibroid, was losing constantly large quantities of limpid fluid supposed to be from the uterus, but which was ultimately proved to come from the bladder. And he might say that it was not only retroversion of the uterus with a fibroid which could cause impaction, but some forms of fibrous tumour without backward displacement, particularly those ovoid forms in which the lower segment fitted closely into the brim and cavity of the pelvis, might become fixed there and lead to troublesome symptoms, which occasionally developed themselves very suddenly. He had sometimes been surprised how small an amount of force

exercised in pushing up the tumour from below would bring at least temporary relief to the symptoms; and he thought in every case prolonged and persistent efforts in the way of taxis, as in Dr. Duncan's instances, should be tried before it was determined to open the abdomen, although this last has been so signally successful in Mr. Meredith's case.

Mr. MEREDITH, in replying to the remarks made by Dr. Champneys with regard to the advantages of hydrostatic pressure in the management of these conditions, stated that the absolute fixation of the pelvic tumour in his case—as evidenced during the repeated attempts which were made to displace it, afforded ample justification for the resort to abdominal section as the only means of relieving the patient. While agreeing in general with Dr. Champneys' views as to the influence of atmospheric pressure in impeding the extraction of a pelvic tumour after the abdomen has been opened, he did not believe that this factor had much to do with the difficulty experienced in the present instance. The growth was exceedingly firm and incompressible, and, after its partial dislodgement from the pelvic cavity, complete extraction was found to be impossible until some amount of enucleation had been practised on the left side. This fact alone proved conclusively that nothing short of operation could have been successful in affording even temporary relief to the patient's sufferings.

DECEMBER 5TH, 1888.

JOHN WILLIAMS, M.D., President, in the Chair.

Present—44 Fellows and 4 Visitors.

Books were presented by Dr. Duka, Dr. Matthews Duncan, Dr. Treub, the Medical Society of London, and the Obstetrical Society of Edinburgh.

J. Bland Sutton, F.R.C.S., was admitted a Fellow of the Society.

William Macfie Campbell, M.D.Edin. (Liverpool); Charles Newton Cornish, L.R.C.P.Edin. (Bushey Heath); and Henry Edward Haycock (Welwyn) were declared admitted.

The following gentlemen were proposed for election:—William James Best, M.R.C.S. (Dover); Edward Thomas Crouch, M.R.C.S. (Gosport): Arthur Graham, L.R.C.P. and S.Edin; Ernest Solly, M.B.Lond., F.R.C.S.Eng; and Andrew Ellis Wynter, L.R.C.P.

The President nominated the following gentlemen as Auditors of the accounts for the year:—Dr. Champneys, Dr. Boulton, Dr. Herbert R. Spencer, Dr. Prickett, and Dr. John Phillips.

ON THE EFFECT OF GLYCERINE ON THE QUANTITY OF SECRETIONS POURED INTO THE VAGINA.

By G. Ernest Herman, M.B.Lond., F.R.C.P.,
OBSTETRIC PHYSICIAN TO THE LONDON HOSPITAL.

(Received May 2nd, 1888.)

(*Abstract.*)

The paper relates observations made to see whether the commonly, but not universally, accepted belief, that the local use of glycerine causes a flow of fluid from the vagina, was correct or not.

The observations were made with cotton-wool plugs soaked in glycerine, and with pessaries made of gelatine and glycerine. The amount of glycerine inserted into the vagina was weighed; the discharge from the vagina was weighed, and the amount of vaginal discharge from the same patient when glycerine was not used, was also ascertained by weight.

The result of the observations was in favour of the following conclusions: 1. That when the secretions poured into the vagina are not abundant the local use of glycerine increases them. 2. That when the secretions poured into the vagina are already abundant the local use of glycerine does not increase them.

It is a common practice to treat certain morbid conditions of the uterus by the insertion into the vagina up to the cervix uteri of plugs of cotton wool soaked in glycerine. It is commonly stated that this application causes a flow of fluid from the uterus; that it acts as a local hydragogue.

So far as I am aware, no proof has ever been given of

this statement, nor has any attempt been made, or at least recorded, to see whether it be the fact or not, that glycerine plugs produce this effect, and different opinions are held on the point.

The belief in question has hitherto rested, so far as I can judge, simply upon the fact that some patients say that a discharge follows the use of the plugs. But this proves nothing, for the discharge may be simply the glycerine running away, to say nothing of other sources of error, or of the fact that not every patient notices such a discharge.

It seemed to me that it would be easy to find out whether or not the glycerine has the property imputed to it, and I have therefore made some observations to determine the point.

I do not propose to discuss the clinical utility of this therapeutic means, but merely the question whether the presence of glycerine in the vagina causes an outpouring of fluid into that canal or not.

The observations were made in the ward for diseases of women (Victor) in the London Hospital. Patients were selected in whom there was not present either great local tenderness or any other condition upon which the necessary manipulations could have an injurious effect.

The method adopted was the following:—The vagina was wiped with dry cotton-wool, so as to remove the secretions already in it. It was then filled with plugs of cotton-wool, in some observations dry, in others saturated with glycerine. The plugs, before being inserted, were weighed. Sometimes, when glycerine plugs were used, a few dry plugs, also weighed, were put in after the glycerine plugs, to absorb such glycerine as the pressure of the vaginal wall might squeeze out. The patient was directed to wear a clean napkin or a wool pad, which was weighed before use. At the end of about twenty-four hours in most observations, twelve hours in some, the napkin or pad was again weighed, the plugs were removed from the vagina and weighed, and the vagina was wiped with a swab or swabs of cotton-wool weighed before and after use. The increase

in weight of napkin (or pad), plugs and swabs, of course showed the amount of secretion poured into the vagina. In the same patient observations were made alternately with dry plugs and with glycerine plugs, so that the results might be compared, and to avoid error the observations were repeated more than once on the same patient.

In relating the observations I shall first state the general conclusions to which the observations point, and after each detail the observations which support it.

1. *When the secretions poured into the vagina are not abundant the use of glycerine plugs increases them.*

CASE 1.—E. G—, aged 34. Married thirteen years; sterile. Oophoralgia, headaches, dyspepsia, slight prolapse and cystocele; menstruation irregular and scanty. Slight leucorrhœa before menstruation, not at other times.

	Vaginal secretions with	
	Dry plugs.	Glycerine plugs.
	Grains.	Grains.
Observation 1.		
May 24th.—Six dry plugs inserted, weighing 107 grains; napkin applied, weighing 533 grains. Total 640 grains.		
25th.—Plugs on removal after 24 hours weighed 227 grains; napkin, weight unaltered, 533 grains; swab gained 4 grains. Total 764 grains . . .	124	...
Observation 2.		
25th.—Six glycerine plugs inserted, weighing 664 grains 4 dry plugs, weighing 48 grains; napkin applied weighing 532 grains. Next morning napkin had to be changed and a fresh one applied, weighing 625 grains. Total 1869 grains.		
26th.—First napkin taken off weighed 694 grains; second weighed 769 grains; plugs weighed 997 grains; swab gained 15 grains. Total 2475 grains . . .	...	606
Observation 3.		
26th.—Ten dry plugs put in, weighing 153 grains; napkin weighed 611 grains. Total 764 grains.		
27th.—Plugs on removal after 24 hours weighed 410		

	Vaginal secretions with	
	Dry plugs.	Glycerine plugs.
	Grains.	Grains.
grains; swab gained 3 grains; napkin weighed 613 grains. Total 1026 grains	262	...
Observation 4.		
31st.—Six glycerine plugs put in, weighing 449 grains; 4 dry plugs, weighing 63 grains; napkin weighing 327 grains. Total 839 grains.		
June 1st.—Napkin removed weighs 408 grains; plugs weigh 995 grains; swab gained 5 grains. Total 1408 grains	...	569

Further observations were begun upon this patient, but as there were indications of approaching menstruation I do not quote them.

CASE 2.—A. W—, aged 21. Admitted for dysmenorrhœa; symptoms of prolapse; retroflexion; dyspepsia. One child; no other pregnancy.

Observation 1.		
May 19th.—Four glycerine plugs put in, weighing 384 grains (42 grains plugs, 342 grains glycerine); 4 dry plugs, weighing 44 grains; napkin weighing 530 grains. Total 958 grains.		
20th.—Plugs removed after 24 hours weigh 560 grains; napkin weighs 918 grains; swab gained 5 grains. Total 1483 grains	...	525
Observation 2.		
20th.—Six glycerine plugs put in, weighing 568 grains; 3 dry plugs, weighing 42 grains; napkin applied weighing 810 grains. Total 1420 grains.		
21st.—Plugs removed after 24 hours weigh 780 grains; mop gained 8 grains; napkin weighed 1050 grains. Total 1833 grains	...	413
Observation 3.		
23rd.—Six dry plugs put in, weighing 98 grains; napkin applied weighing 637 grains. Total 735 grains.		
24th.—Plugs removed after 24 hours weigh 180 grains; napkin weighed 639 grains. Total 829 grains . .	94	...

	Vaginal secretions with	
	Dry plugs.	Glycerine plugs.
	Grains.	Grains.
Observation 4.		
24th.—Six glycerine plugs put in, weighing 413 grains; 2 dry plugs weighing 28 grains; napkin applied, weighing 605 grains. Total 1046 grains.		
25th.—Plugs removed after 24 hours weigh 694 grains; Swab gained 10 grains; napkin weighs 911 grains. Total 1624 grains	...	578
Observation 5.		
June 3rd.—Two glycerine plugs put in, weighing 24 grains; 6 dry plugs, weighing 108 grains; napkin weighing 879 grains. Total 1227 grains.		
4th.—Plugs removed after 24 hours weigh 770 grains; swab gained 4 grains; napkin weighs 956 grains. Total 1730 grains	...	503
Observation 6.		
4th.—Eight dry plugs put in, weighing 108 grains; napkin applied, weighing 1012 grains. Total 1120 grains.		
5th.—Plugs removed after 24 hours weigh 164 grains; napkin weighs 1012 grains. Total 1176 grains .	56	...

Case 3.—C. P—, aged 26. One miscarriage, no other pregnancy; admitted for retroversion, with symptoms of slight prolapse; ovarian pain and tenderness; migrainous headaches; slight leucorrhœa.

Observation 1.		
June 13th.—Six dry plugs put in, weighing 110 grains pad weighing 425 grains. Total 535 grains.		
14th.—Plugs removed after 24 hours weigh 217 grains; swab gained 4 grains; pad weighs 425 grains. Total 646 grains	111	...
Observation 2.		
14th.—Four glycerine plugs put in, weighing 429 grains; 4 dry plugs, weighing 52 grains; pad weighing 422 grains; Total 903 grains.		
15th.—Plugs removed after 24 hours weigh 740 grains; swab gained 33 grains; pad weighs 525 grains. Total 1298 grains	...	395

In the pair of observations which follow the plugs were

only allowed to remain in the vagina 12 hours instead of 24 hours, as in those previously related.

	Vaginal secretions with	
	Dry plugs.	Glycerine plugs.
	Grains.	Grains.
Observation 3.		
17th, 11 a.m.—Ten dry plugs put in, weighing 175 grains; pad weighing 284 grains. Total 459 grains.		
17th, 11 p.m.—Plugs removed weigh 366 grains; swab gained 4 grains; pad weighs 288 grains. Total 658 grains	199	...
Observation 4.		
18th, 11 a.m.—Four glycerine plugs put in, weighing 411 grains; 2 dry plugs, weighing 34 grains; napkin weighing 386 grains. Total 831 grains.		
18th, 11 p.m.—Plugs removed after 12 hours weigh 830 grains; swab gained 27 grains; napkin weighed 404 grains. Total 1261 grains	...	430

CASE 4.—A. C—, aged 27; four children. Admitted for vulvitis and chronic rheumatism, both dating from what was probably an attack of gonorrhœa a year and nine months previously.

Observation 1.		
July 23rd.—Six dry plugs put in, weighing 139 grains; pad applied, weighing 533 grains. Total 672 grains.		
24th.—Plugs removed after 24 hours weighed 270 grains; mop gained 5 grains; pad weighed 533 grains. Total 808 grains	136	...
Observation 2.		
24th.—Six glycerine plugs put in, weighing 628 grains; pad applied, weighing 386 grains. Total 1014 grains.		
25th.—Plugs removed after 24 hours weighed 609 grains; mop gained 2 grains; pad weighed 554 grains. Total 1182 grains	...	168
Observation 3.		
25th, 11 a.m.—Six dry plugs put in, weighing 141 grains; pad applied, weighing 310 grains. Total 451 grains.		
25th, 10 p.m.—Plugs removed after 11 hours weighed 223 grains; mop gained 4 grains; pad weighed 310 grains. Total 537 grains	86	...

	Vaginal secretions with	
	Dry plugs.	Glycerine plugs.
	Grains.	Grains.
Observation 4.		
25th, 10 p.m.—Six glycerine plugs put in, weighing 706 grains; pad applied, weighing 310 grains. Total 1016 grains.		
26th, 10 a.m.—Plugs removed after 12 hours weighed 1076 grains; mop gained 10 grains; pad weighed 432 grains. Total 1518 grains . . .	...	502

CASE 5.—L. F—, aged 32; single; never pregnant. Admitted for vaginitis with pruritus vulvæ.

Observation 1.		
August 8th.—Six dry plugs inserted, weighing 125 grains; pad applied, weighing 383 grains. Total 508 grains.		
9th.—Plugs removed after 24 hours weighed 331 grains; mop used gained 4 grains; pad weighed 398 grains. Total 733 grains	225	...
Observation 2.		
12th.—Glycerine plugs inserted, weighing 834 grains; pad applied, weighing 278 grains. Total 1112 grains. Another pad was subsequently required, which weighed 294 grains. Total 1406 grains.		
13th.—Plugs removed weigh 840 grains. First pad weighed on removal 540 grains; second pad 460 grains; swab gained 18 grains. Total 1858 grains . .	...	452

CASE 6.—A. R—, aged 18; married eighteen months; never pregnant. Admitted for retention of urine.

Observation 1.		
December 3rd.—Six dry plugs inserted, weighing 70 grains; pad applied, weighing 352 grains. Total 422 grains.		
4th.—Plugs removed weigh 130 grains; pad removed weighs 355 grains; swab gained 2 grains. Total 487 grains	65	...
Observation 2.		
4th.—Two glycerine plugs inserted, weighing 90 grains; 6 dry plugs, weighing 58 grains; pad applied, weighing 398 grains. Total 646 grains.		

	Vaginal secretions with	
	Dry plugs.	Glycerine plugs.
	Grains.	Grains.
5th.—Plugs removed weigh 441 grains; swab gained 6 grains; pad weighs 424 grains. Total 871 grains .	...	225
Observation 3.		
9th.—Four glycerine plugs inserted, weighing 400 grains; 2 dry plugs, weighing 10 grains; pad applied, weighing 330 grains. Total 740 grains.		
10th.—Plugs removed weigh 625 grains; swab gained 11 grains; pad removed weighs 638 grains. Total 1274 grains	...	534

2. *When the secretions in the vagina are already abundant the use of glycerine plugs does not increase them.* In other words, where there is already enough fluid poured out to saturate the glycerine, a further secretion or transudation is not produced.

CASE 7.—M. A. H—, aged 38; five children; two miscarriages. Chronic endometritis.

Observation 1.		
June 3rd.—Ten dry plugs put in, weighing 146 grains; napkin applied, weighing 621 grains. Total 767 grains.		
4th.—Napkin removed after 24 hours weighs 645 grains; Plugs weigh 776 grains; swab gained 4 grains. Total 1425 grains	658	...
Observation 2.		
4th.—Six glycerine plugs put in, weighing 606 grains; 4 dry plugs, weighing 57 grains; napkin applied, weighing 794 grains. Total 1457 grains.		
5th.—Plugs removed after 24 hours weigh 1124 grains; napkin weighs 839 grains. Total 1963 grains . .	...	506

CASE 8.—E. D—, aged 23; single. Anæmia, leucorrhœa, ovarian pain; formerly symptoms of gastric ulcer.

Observation 1.		
May 12th.—Six dry plugs put in, weighing 86 grains.		
13th.—Plugs removed after 24 hours weigh 513 grains; swab gained 3 grains. Total 516 grains . .	430	...

	Vaginal secretions with	
	Dry plugs.	Glycerine plugs.
	Grains.	Grains.
Observation 2.		
16th.—Six dry plugs put in, weighing 74 grains.		
17th.—Plugs removed after 24 hours weigh 515 grains; swab gained 5 grains. Total 520 grains . . .	446	...

In these experiments the weighing of the napkin was omitted; possibly if this had been done the secretions might have been found to be more than the amount actually ascertained.

Observation 3.		
17th.—Four glycerine plugs put in, weighing 390 grains; 3 dry plugs, weighing 30 grains; dry napkin applied, weighing 640 grains. Total 1060 grains.		
18th.—Plugs removed after 24 hours weigh 600 grains; napkin weighs 966 grains. Total 1566 grains . .	...	506
Observation 4.		
19th.—Six dry plugs put in, weighing 82 grains; napkin weighing 680 grains. Total 762 grains.		
20th.—Plugs removed after 24 hours weigh 503 grains; swab gained 5 grains; napkin weighed 1143 grains. Total 1651 grains	889	...
Observation 5.		
20th.—Four glycerine plugs put in, weighing 752 grains; 2 dry plugs, weighing 30 grains; napkin applied, weighing 630 grains. Total 1412 grains.		
21st.—Plugs removed after 24 hours weigh 793 grains; mop gained 16 grains; napkin weighs 990 grains. Total 1799 grains	...	387

The next set of observations were made after the patient had been some time under treatment; general tonic treatment only, no local treatment was employed.

Observation 6.		
July 23rd.—Six dry plugs put in, weighing 117 grains; pad applied, weighing 344 grains. Total 461 grains.		
24th.—Plugs removed after 24 hours weigh 345 grains; swab gained 2 grains; pad weighs 387 grains. Total 734 grains	273	...

	Vaginal secretions	
	Without glycerine.	With glycerine.
	Grains.	Grains.
Observation 7.		
24th.—Six glycerine plugs put in, weighing 616 grains; pad applied, weighing 316 grains. Total 932 grains.		
25th.—Plugs removed after 24 hours weigh 721 grains; swab gained six grains; pad weighs 506 grains. Total 1233 grains	...	301
Observation 8.		
25th, 11 a.m.—Six dry plugs put in, weighing 103 grains; pad applied, weighing 307 grains. Total 410 grains.		
25th, 10 p.m.—Plugs removed weigh 216 grains; mop gained 4 grains; pad weighs 540 grains. Total 760 grains	350	...
Observation 9.		
25th, 10 p.m.—Six glycerine plugs put in, weighing 486 grains; pad applied, weighing 291 grains. Total 777 grains.		
26th, 10 a.m.—Plugs removed after 12 hours weigh 801 grains; swab gained 5 grains; pad weighs 413 grains. Total 1219 grains	...	452

It will be seen that in this case, when the patient was first admitted, the vaginal discharge was abundant, and was not appreciably increased by the use of glycerine plugs; while after the patient had been under general treatment for two months the discharge was diminished, and then the glycerine plugs produced an increase in the secretions.

The first conclusion, "that when the vaginal secretions are not abundant the use of glycerine plugs usually increases them," is supported by twenty-three observations, made upon six different patients. In ten of these dry plugs were used, and the average amount of secretion poured into the vagina in twenty-four hours was 135·8 grains. In thirteen observations glycerine plugs were used, and the average amount of secretions was 453·8 grains: an excess, presumably due to the glycerine, of 318 grains.

The plugs were prepared by the nurse, who guessed at the proper size. It was not at the time thought necessary

to weigh the plugs before and after saturation with glycerine, and therefore it is not possible to state exactly the weight respectively of wool and glycerine in the plugs used for these observations. But the average weight of each dry plug was 16 grains, and, assuming the piece of wool used for each glycerine plug to have been of about the same size (which will be near the truth), this would give the average amount of glycerine placed in the vagina as 355·5 grains, so that the glycerine seemed to cause an outpouring of fluid into the vagina in amount nearly equal to its own weight.

The conditions which influence secretion are so various, that it would need a great number of observations to formulate any more exact proposition than that which I have stated. The investigation was undertaken to find out whether the common belief was in accordance with fact, or was merely a theory invented to account for certain statements made by patients, and I think the cases given are enough to show that the asserted hydragogue action of glycerine, at least in some cases, is a fact.

It does not take place in every case nor in all circumstances. In Case 4, Observation 2, the amount of secretion produced by the glycerine was much below the average of other cases, and the amount ascertained by another observation in this case. I can give no explanation of this, except that it may have been due to some nervous alteration of the secretory activity.

In most of the observations the glycerine plugs were left in the vagina for twenty-four hours. In three of them the glycerine only remained twelve hours, but in these the average amount of secretion was 461 grains, an amount very little less than that obtained when the plugs were left in for twenty-four hours.

The observations above detailed show beyond doubt that the insertion into the vagina of plugs of cotton-wool soaked in glycerine is usually followed by an increase in the secretions poured into that canal.

But an objection may be urged against this conclusion.

It may be said that the increased secretion is really due to irritation by the cotton-wool plug. But the fact that dry plugs did not produce the same flow of secretion as glycerine plugs, shows that this is not the whole explanation. If in all the experiments dry plugs had been first used, then glycerine, it might perhaps with some plausibility have been maintained that the augmented secretion was really due to the continuance of irritation, and would have equally been present had dry plugs been used for two successive days. This possible fallacy is disposed of by Case 2, in which glycerine plugs were first used, then dry ones; and the increased secretion here accompanied the glycerine plugs as in the other cases.

It must nevertheless be admitted that the presence of the cotton-wool plug does undoubtedly complicate the experiment. To get results free from this complication I have made other observations, using, instead of cotton-wool plugs, pessaries made of gelatine and glycerine, such as were exhibited to this Society by Dr. Gervis ('Trans.,' vol. xxvii, p. 163). The pessaries used were composed of one part of gelatine to four of glycerine. The patient was given four of these to be used in the twenty-four hours. This was done every alternate day. Every day the patient was given a pad of absorbent wool, and this was weighed before and after use. Thus the weight of secretions flowing on to the pad with and without glycerine plugs was ascertained.

This method, of course, has fallacies of its own; but the only fallacies that I can see, all work in the direction of minimising rather than of magnifying differences in the amount of secretion. The increase in weight of the pad does not show what amount of vaginal secretions may have flowed away during urination or defæcation. The introduction of the pessaries was left to the patient. It will be seen that while, as a rule, the flow from the vagina was increased by the pessaries, there are four observations which show a marked diminution. This appears a contradiction difficult to understand. If correct, it would show that sometimes the glycerine was absorbed instead of pro-

ducing a flow of secretion. I think the probable explanation is that the patient omitted to put in one or perhaps two pessaries.

The observations show that, as a rule, on the days on which the glycerine pessaries were used, the amount of fluid that flowed on to the pad was more than the weight of the pessaries inserted; and the difference was more than the secretions that the pad took up on the days when the pessaries were not used. This shows that the pessaries produced an increase in the secretions; and if the probability of the discharge of some vaginal secretion with urination and defæcation be admitted, it follows that the increase produced was more than the observations show.

Case 9.—A. H—, aged 24; one child four years ago; no miscarriages. Admitted for slight prolapse.

	Vaginal secretions	
	Without glycerine.	With glycerine
	Grains.	Grains.
Observation 1.		
January 30th.—Pad applied, weighing 325 grains.		
31st.—Pad removed weighed 325 grains . .	0	...
Observation 2.		
31st.—Pad applied, weighing 385 grains; 4 pessaries put in, weighing 480 grains.		
February 1st.—Pad removed weighed 965 grains .	...	100
Observation 3.		
1st.—Pad applied, weighing 358 grains.		
2nd.—Pad removed weighed 400 grains . .	42	...
Observation 4.		
2nd.—Pad applied, weighing 335 grains; 4 pessaries put in, weighing 485 grains.		
3rd.—Pad removed weighed 888 grains . .	...	68
Observation 5.		
3rd.—Pad applied, weighing 326 grains.		
4th.—Pad removed weighed 326 grains . .	0	...

	Vaginal secretions	
	Without glycerine.	With glycerine.
	Grains.	Grains.
Observation 6.		
4th.—Pad applied, weighing 342 grains; (?) 4 pessaries put in, weighing 495 grains.		
5th.—Pad removed weighed 790 grains . .	...	– 47
Observation 7.		
5th.—Pad applied, weighing 295 grains.		
6th.—Pad removed weighed 295 grains . .	0	...
Observation 8.		
6th.—Pad applied, weighing 368 grains; 4 pessaries put in, weighing 460 grains.		
7th.—Pad removed weighed 845 grains . .	...	17
Observation 9.		
7th.—Pad applied, weighing 277 grains.		
8th.—Pad removed weighed 279 grains . .	2	...
Observation 10.		
8th.—Pad applied, weighing 273 grains.		
9th.—Pad removed weighed 277 grains . .	4	...

CASE 10.—S. D—, aged 25. Admitted for ovarian pain; fissure of rectum; early pregnancy.

Observation 1.		
January 4th.—Pad applied, weighing 350 grains.		
5th.—Pad removed weighed 353 grains . .	3	...
Observation 2.		
5th.—Pad applied, weighing 256 grains; 4 pessaries put in, weighing 480 grains.		
6th.—Pad removed weighed 843 grains . .	...	107
Observation 3.		
6th.—Pad applied, weighing 304 grains.		
7th.—Pad removed weighed 306 grains . .	2	...
Observation 4.		
7th.—Pad applied, weighing 252 grains; (?) 4 pessaries put in, weighing 480 grains.		
8th.—Pad removed weighed 667 grains . .	...	– 65
Observation 5.		
8th.—Pad applied, weighing 260 grains.		
9th.—Pad removed weighed 264 grains . .	4	...

	Vaginal secretions	
	Without glycerine.	With glycerine.
	Grains.	Grains.
Observation 6.		
9th.—Pad applied, weighing 269 grains; 4 pessaries put in, weighing 480 grains.		
10th.—Pad removed weighed 810 grains . .	...	61
Observation 7.		
10th.—Pad applied, weighing 302 grains.		
11th.—Pad removed weighed 303 grains . .	1	...
Observation 8.		
11th.—Pad applied, weighing 365 grains; 4 pessaries put in, weighing 480 grains.		
12th.—Pad removed weighed 905 grains . .	...	60
Observation 9.		
February 2nd.—Pad applied, weighing 245 grains; 4 pessaries put in, weighing 491 grains.		
3rd.—Pad removed weighed 796 grains . .	...	60
Observation 10.		
3rd.—Pad applied, weighing 340 grains.		
4th.—Pad removed weighed 349 grains . .	9	...
Observation 11.		
4th.—Pad applied, weighing 338 grains; 4 pessaries put in, weighing 482 grains.		
5th.—Pad removed weighed 1003 grains . .	...	183
Observation 12.		
5th.—Pad applied, weighing 317 grains.		
6th.—Pad removed weighed 318 grains . .	1	...
Observation 13.		
6th.—Pad applied, weighing 348 grains; 4 pessaries put in, weighing 447 grains.		
7th.—Pad removed weighed 985 grains . .	...	110
Observation 14.		
7th.—Pad applied, weighing 258 grains.		
8th.—Pad removed weighed 265 grains . .	7	...
Observation 15.		
8th.—Pad applied, weighing 334 grains.		
9th.—Pad removed weighed 344 grains . .	10	...
Observation 16.		
9th.—Pad applied, weighing 324 grains.		
10th.—Pad removed weighed 333 grains . .	9	...

	Vaginal secretions	
	Without glycerine.	With glycerine.
	Grains.	Grains.
Observation 17.		
10th.—Pad applied, weighing 301 grains.		
11th.—Pad removed weighed 302 grains . .	1	...
Observation 18.		
11th.—Pad applied, weighing 353 grains.		
12th.—Pad removed weighed 356 grains . .	3	...

CASE 11.—J. B—, aged 24; married; never pregnant. Admitted for dysmenorrhœa.

Observation 1.		
April 13th.—Pad applied, weighing 364 grains.		
14th.—Pad removed weighed 366 grains . .	2	...
Observation 2.		
14th.—Pad applied, weighing 273 grains; 4 pessaries (?) inserted, weighing 283 grains.		
15th.—Pad removed weighed 545 grains . .	...	– 11
Observation 3.		
15th.—Pad applied, weighing 357 grains.		
16th.—Pad removed weighed 360 grains . .	3	...
Observation 4.		
16th.—Pad applied, weighing 539 grains; 4 pessaries inserted, weighing 283 grains.		
17th.—Pad removed weighed 296 grains . .	...	104
Observation 5.		
17th.—Pad applied, weighing 278 grains.		
18th.—Pad removed weighed 340 grains . .	72	...
Observation 6.		
18th.—Pad applied, weighing 885 grains; 4 pessaries inserted, weighing 280 grains.		
19th.—Pad removed weighed 1220 grains . .	...	55
Observation 7.		
19th.—Pad applied, weighing 260 grains.		
20th.—Pad removed weighed 280 grains . .	20	...
Observation 8.		
20th.—Pad applied, weighing 552 grains; 4 pessaries put in, weighing 282 grains.		
21st.—Pad removed weighed 938 grains . .	...	104

	Vaginal secretions	
	Without glycerine.	With glycerine.
	Grains.	Grains.
Observation 9.		
21st.—Pad applied, weighing 878 grains.		
22nd.—Pad removed weighed 902 grains . .	24	...
Observation 10.		
22nd.—Pad applied, weighing 910 grains; 4 pessaries ut in, weighing 280 grains.		
23rd.—Pad removed weighed 1167 grains . .	...	– 23
Observation 11.		
23rd.—Pad applied, weighing 963 grains; 4 pessaries inserted, weighing 280 grains.		
24th.—Pad removed weighed 1360 grains . .	..	117

Taking these observations collectively, I find that in twenty-two observations, made in three cases, in which the vaginal discharge was weighed, the average amount was 9·9 grains in twenty-four hours. This average is raised by the presence on certain days of discharge so much more copious than usual, that it seems as if due to some temporary cause special to those days; in one case this cause was probably approaching menstruation. If these observations (four in number) be taken out, as being exceptional, the average then is only 2·7 grains in the twenty-four hours. In thirteen observations in which the vaginal discharge on to a pad was also weighed, but the patients each time during the twenty-four hours had inserted into the vagina pessaries containing on an average 315 grains of glycerine, the average discharge was 87·7 grains in excess of the weight of the pessaries inserted. In four others the discharge was less than the weight of the pessaries which the patient said she had inserted. I think it more probable that the patient should have omitted to fulfil the instructions given to her than that the vagina should sometimes absorb glycerine, sometimes pour out fluid to satisfy the affinity of the glycerine for water.*

* To show that such omission is likely I may mention that, in some observations (not related here, as being manifestly erroneous) the pad was found

Dr. CHAMPNEYS asked whether Dr. Herman had estimated the loss on the diapers from evaporation; the conditions were favourable for evaporation, and would confirm the conclusions arrived at in the paper,

Dr. GRIFFITH said that there was an important question which needed to be settled before the value of Dr. Herman's paper could be fully estimated, namely, as to whether the secretion contained in the vagina was formed in the vagina or merely contained in it. Anatomically the vagina was lined by skin and not mucous membrane; it contained no mucous glands, and in cases in which the vagina was inverted, as in procidentia of the uterus and cystocele, its surface became dry and horny, and had no secretion but what was evidently uterine. The action of glycerine on it would then be similar to the action on any surface skin, and that was to irritate it, and, by absorbing the moisture in the surface-cells, to render it more dry than it was before. Dr. Klein had recently told Dr. Griffith that in his opinion the acidity of the vaginal mucus is due to decomposition, as is also the case with the sweat.

Dr. HERMAN, in reply to Dr. Champneys, said that he had not estimated the loss of weight by the napkins or pads due to evaporation, but he thought it was slight. There was a possible cause of slight increase in weight which he also had not estimated, viz. the perspiration from the skin with which the napkin or pad was in contact. Possibly the one nearly balanced the other. In reply to Dr. Griffith, he pointed out that he had used the words "secretions poured into the vagina," which did not imply any opinion as to the source of the secretion. He did not know whether the increased secretion came from the uterus or vagina, whether it was a product of glandular activity or the result of osmosis. He should be obliged to Dr. Griffith if he could suggest any method, harmless to the patient, by which the secretions of the uterus could be separated from those of the vagina. He thought, notwithstanding Dr. Griffith's stimulating scepticism, that the vagina did secrete mucus. In cases of atresia of the vagina at more than one place collections of mucous fluid were found between the occlusions. In cases of atresia of the os uteri externum, the vagina was as moist as in most other patients. That under pathological conditions it might pour out fluid in abundance needed no demonstration.

to have *diminished* in weight, the patient having probably torn off some of the wool.

OBLITERATION OF THE CENTRAL CANAL OF THE SPINAL CORD IN AN EARLY HUMAN EMBRYO.

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(Communicated by Dr. Champneys.)

In the last volume of the 'Transactions of the Obstetrical Society,' vol. xxix for 1887, I described a case of retroflection of an early human embryo associated with absence of the spinal medulla and imperfection of the vertebral column. Since then another embryo has been found in which the spinal medulla is abnormal, and seems worthy of a brief description. It is to be regretted that the history of the specimen was not obtained. A sketch made from it seems comparable with His's drawings of thirty-six day human embryos.* The external configuration seemed normal, except that the umbilical cord had a swelling upon it, which afterwards proved to consist of ordinary Whartonian jelly, the spaces of which were expanded. The fore and hind limbs were of the same length, and the knee and elbow flexures were apparent, together with slight traces of fingers and toes. The specimen had been hardened and kept in rectified spirit, but my notes say that the head was very soft; it was stained in picrocarmine, embedded in paraffin, and cut into a series of transverse sections, which, however, did not include the head. Before describing the abnormality of the spinal medulla it is desirable to mention the condition of the other organs. The skeleton was entirely cartilaginous,

* 'Anatomie menschlichen Embryonen,' W. His, Atlas iii, Tafel 10, fig. 18.

and the vertebral column, ribs, and pelvic and shoulder girdles seemed quite normal, although the neural and pubic arches were still incomplete, and only some of the cartilages of the hand and foot had appeared. The muscles of the trunk and limbs had also begun to develop, and were probably such as are natural to an embryo of this stage. The heart and the rest of the vascular system had no peculiarity, and seemed to afford an abundant supply of blood to the trunk and limbs, as well as to the great organs and placenta. The alimentary canal, air-passages, and lungs possessed their usual epithelial lining, as did also the tubules and glomeruli of the kidneys and Wolffian bodies. The liver and adrenals were large, and their histological structure clear and distinct. Thus, up to this point, there was nothing to suggest either deformity or disease; but the same cannot be said of the spinal medulla. The dorsal part of that organ was very abnormal, and perhaps an idea of its abnormality may be given by describing and depicting sections from each region, namely, the lumbar, dorsal, and cervical. But in carrying out this proposal, the minute histology of the cord will be dealt with very superficially. This is necessitated by the meagreness of our knowledge of the developmental phases of the normal tissues, and also because, in the present case, the tissues had deteriorated somewhat by soakage in amniotic fluid. Commencing, therefore, with a section through the lumbar region of the cord (Fig. 1) the following details can be seen with a low power (1 in.). The central canal is a long and narrow vertical slit lined with a layer of columnar epithelium, whose cells are very clear ventralwards, but become fainter and less columnar dorsalwards, and seem in process of conversion into the posterior grey commissure. The central canal is surrounded with rudimentary grey substance, and this again is covered on either side and below with a thin layer of white matter, which is thickest below, but absent on, the dorsum. The whole cord is contained in a sheath of connective tissue, and between this sheath and the neural arches are the spinal ganglia.

The accompanying drawing (Fig. 1) is, I think, a faithful representation of the above appearances. Human embryos are so often decomposed that the material obtained from them should be received with suspicion. The tissues under consideration show the preceding details quite plainly, and although they are not altogether perfect, yet it is clear

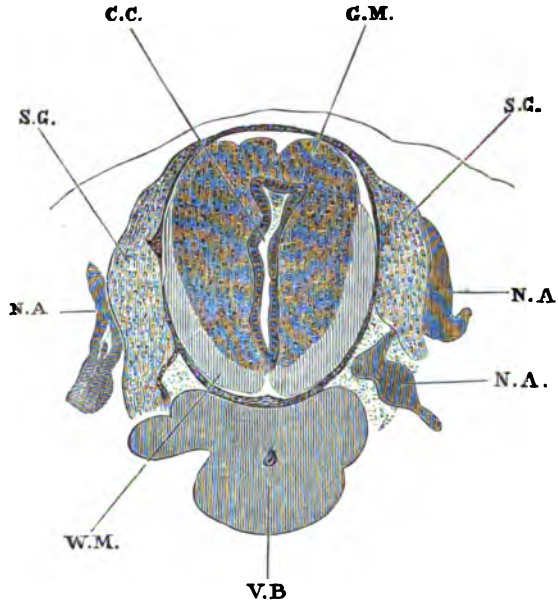


FIG. 1.—Through lumbar region of spinal cord. × 25.
C. C. Central canal.
G. M. Grey matter of the spinal cord.
W. M. White matter of the spinal cord.
S. G. Spinal ganglion.
V. B. Body of vertebra.
N. A. Portions of the neural arch.

that their deterioration must have been comparatively slight. Compared with the spinal cord of the embryos of pigs, rats, and rabbits of the corresponding degree of development, none of its constituents are wanting or in

undue proportion.* So far as concerns the present argument it is sufficient to be able to assert the actual presence of a central canal and its epithelial lining and of grey and white substance. It is evident that our material is more than good enough for this purpose, although not, perhaps, reliable for more minute histology; such, for instance, as the characters of the individual cell elements.

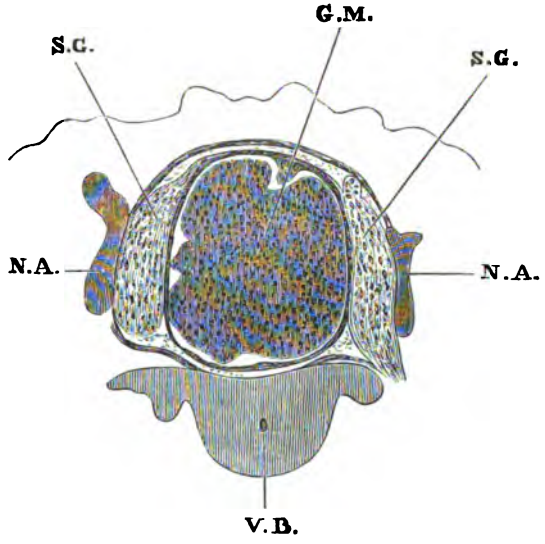


FIG. 2.—Through the dorsal region of the spinal cord. × 25.
References same as in Fig. 1.

The dorsal part of the spinal cord may be considered next and differs greatly from the lumbar. The cartilaginous substance, fibrous sheath, spinal ganglia, and other surroundings of the cord, are quite normal, but the latter seems to consist of nothing but grey substance without a trace of a central canal or of its epithelial lining (Fig. 2). Although the white substance is absent there are small irregular fibrous patches, which seem to resemble it.

* Compare Foster and Balfour, 'The Elements of Embryology,' 2nd edit., 1883, p. 251, *et seq.*, and fig. 83; also Kölliker, 'Entwicklungsgeschichte des Menschen,' 1879, p. 584, fig. 374.

Before endeavouring to discuss this circumstance it is convenient to refer to the other sections of the series. They show that the central canal, traced from the lumbar region towards the head, is gradually obliterated, that its lumen disappears first, and lastly the ventral part of its epithelium. Only a short length, however, of the central canal and of its lining membrane is totally deficient, for they both gradually reappear, until in the cervical region they have the characters which are shown in the accompanying figure (Fig. 3). Here the central canal is capacious and, except

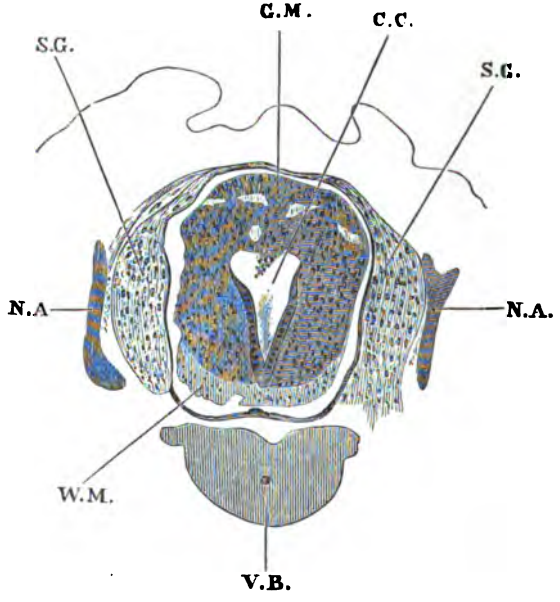


FIG. 3.—Through the cervical region of the spinal cord. × 25.
References same as in Fig. 1.

towards its dorsal aspect, lined with epithelium; moreover, there is a little white substance ventralwards. The various surroundings of the cord are normal and in good condition, although the cord itself looks as though it had suffered from soakage, but by no means to such a degree as to render the preceding statements valueless.

It is clear that in discussing the absence of the central canal and of its epithelium in the dorsal region of this early embryo, the first place must be given to the question whether it may not be due to decomposition. This is always an important consideration in dealing with human embryos, and it cannot be denied that it is entirely absent in the present instance. It may be remembered that it has been said that the head was very soft, and doubtless the upper part of the spinal medulla was similarly affected, but not to such a degree as to obliterate the central canal or destroy its epithelium, or even to obscure the limits between the grey and white matter. The lumbar region, moreover, distinctly negatives the view of more than very slight soakage. The brain of early embryos becomes diffluent sooner than any other organ, but in this specimen the liver, suprarenals, kidneys, and Wolffian bodies were in fair condition, and the two latter still retain their epithelial lining. The tissues which surround the spinal cord are of such a nature as to be less easily injured than the nervous tissue, but nevertheless we may note that they are well preserved. The sections in which there is no central canal lend no support to the theory that its absence is due to decomposition. If such had been the case the periphery of the cord might have been expected to have suffered; but although the white substance is absent the cord itself has not diminished and completely fills the spinal canal. Nor can the central canal have been choked or concealed by *débris* of any sort; the disappearance of its lumen and epithelium is gradual, and the tissues have a definite and homogeneous structure.

Assuming that neither soakage nor decomposition can have caused the appearances which have been described, the next question to be discussed is, whether the mode of preparation is at fault. Here the same arguments prevail, for it is difficult to understand how the processes employed could have such a mere local effect; moreover, although they have been employed for numbers of embryos, an abnormality such as the present one has never been described.

Failing the foregoing alternatives, it is clear that we

have to deal with a fault in the process of development. The exact evolution of the epithelium of the central canal of the cord is hardly settled. Specimens of mammalian embryos show that the dorsal part of the canal becomes obliterated, and its epithelium converted into grey substance. The conversion precedes the obliteration, and seems involved in its causation. An excess of this process would account for the entire obliteration of both canal and epithelium, which has just been described. However, the absence of the white substance seems to point in another direction, and indicate that there has also been a retardation of development.

My own opinion is that most of the so-called abnormalities are the result of disease, more particularly of inflammatory processes. This is best seen in the case of intra-uterine peritonitis, and as our knowledge extends other instances are forthcoming.

Perhaps I may be permitted to point out that the epiblast from which the dorsal portion of the spinal cord is developed is particularly exposed to external influences. The embryos of the rabbit and human subject develop with their dorsal epiblast next to the uterine surface, and, in the rabbit, practically in direct contact with it. Until the middle of the ninth day the rudimentary spinal cord of the rabbit maintains this relation in the dorsal region, but after that period the folds of the amnion intervene. Gynæcologists could easily imagine conditions of the uterine surface which would be calculated to exercise a most pernicious influence upon the epiblast.

Our knowledge of defects of the spinal cord of early embryos is singularly small, but it seems quite possible that they are common,* and are closely related to a variety of well known affections, such as congenital defects of joints,† club foot, and syringo-myelocele.

* Dr. Arthur Jamison has kindly told me that the late Allen Thomson used to show an embryo which had obliteration of the central canal of its spinal cord.

† Cases by author, vol. xxxviii, 'Path. Soc. Trans.,' p. 303, *et seq.*

Mr. Doran asked Mr. Lockwood if he considered that the fœtal diseases to which he referred would explain the development of anencephalous fœtus. Mr. Doran felt sure that no Fellow of the Society would confound that monstrosity with acephalous or acardiac fœtus. The latter was the result of abnormal communications with the vascular system of a brother fœtus in twin gestation. In the anencephalous fœtus the malformation essentially consisted in the fact that the cranial vault never closed in, the brain also remaining undeveloped. Some common cause, evidently local, must explain the simultaneous arrest of development in the cranium and encephalon.

In reply to Mr. Doran, Mr. Lockwood said that defects in the epiblast might be a factor in the pathology of anencephalus. Morbid conditions of the uterine wall would predispose to such defects.

SEQUEL TO A CASE OF BRIGHT'S DISEASE DURING PREGNANCY.

By G. Ernest Herman, M.B.Lond., F.R.C.P.,
OBSTETRIC PHYSICIAN TO THE LONDON HOSPITAL.

In vol. xxix of the Society's 'Transactions' I have published an account of a case of Bright's disease during pregnancy. The patient, aged 21, was delivered (labour having been induced at about seven months pregnancy) on April 18th, 1887. According to the history she gave, symptoms of Bright's disease had then been present for seven or eight weeks. She left the hospital about three weeks after delivery. I now report the termination of the case.

The albumen did not disappear from the urine. Her symptoms, which had slightly improved while in hospital, became worse soon after she went out. She was finally admitted into St. George's Hospital, where she died on January 26th, 1888. The immediate cause of death was acute œdema of the larynx and tongue. I am indebted to Dr. Penrose, medical registrar to the hospital, for an account of the post-mortem examination.

There was no œdema of the feet. The superficial veins of the thorax were distended, and there was general fulness of the neck. The brain-tissue was very firm; there was no excess of fluid in the ventricles; the carotid arteries were very thick-walled, standing widely open when cut. Retinal hæmorrhages. A small quantity of fluid in pleuræ, pericardium, and peritoneum. Tissues of neck sodden. Tongue swollen; it has been incised to diminish œdema, and had been bitten by patient. Pharynx and tonsils congested. Tissues over arytenoid cartilage swollen and semi-

translucent; on cutting into them they are found to contain yellowish jelly-like œdema. Trachea and larynx congested. Lungs œdematous; weight, right 1 lb. 10 oz., left 1 lb. 5 oz. Heart: left ventricle greatly hypertrophied, its wall being an inch thick; valves healthy, very little atheroma of aorta; weight 14 oz. Spleen large and firm, containing a small infarction; weight 7 oz. Kidneys granular, cortex readily peeling; weight 9 oz. Liver large and fatty; weight 4 lb. 4 oz.

The case seems to me of interest, not only as the completed history of a case of puerperal nephritis, but also as an example of the rapid production, at a very early age, of granular kidney, and the cardio-vascular changes associated with it.

EXTRA-UTERINE FŒTATION: ABDOMINAL SECTION EIGHT MONTHS AFTER DEATH OF FŒTUS: SAC FORMED BY LEFT FALLOPIAN TUBE AND LEFT BROAD LIGAMENT: RECOVERY.

By Charles J. Cullingworth, M.D.

R. R—, aged 27, residing at Walworth, was admitted into St. Thomas's Hospital under my care July 31st, 1888.

Up to the time of her marriage, at the age of nineteen, she menstruated regularly. Her first child was born within a year after her marriage, and fourteen months after this a second child was born. This second and last confinement occurred five years ago. She did not suckle the child, and menstruation re-commenced six weeks after its birth, continuing regularly until the middle of April, 1887. From that date she had no vaginal discharge of any kind, menstrual or other, until July 28th, 1888, a period of a little more than fifteen months. At the last-mentioned date, which was three days before her admission, she had what appeared to be a normal menstrual period. Towards the end of April, 1887, she began to suffer from morning sickness, and concluded that she was pregnant. Later on the abdomen began to enlarge, and in the month of July she quickened. She continued to feel the fœtal movements from that time up to Christmas. Somewhere about the mouth of August (but she cannot remember the precise date, and is not even sure as to the month) her little boy kicked her in the abdomen, a little above the right iliac crest. A few days after this she had severe pain in the

part, attended with vomiting, and was confined to bed for six or seven weeks. The doctor who attended her told her that she was pregnant, and that there was not much else the matter. The abdomen continued to enlarge until December, when for about an hour she had pains like the beginning of labour. No discharge of any kind took place. From that time the movements ceased, and the size of the abdomen gradually diminished. For the last two months there has been no change in size. She has latterly been feeling ill and weak, but has been able to do her house-work as usual up to the time of her admission. The breasts, which were full at the time of the attack of pain in December, have become smaller, and are now flaccid.

The patient is a small, dark-complexioned, pale woman, well nourished, of healthy appearance and cheerful disposition.

There is a large, irregular, solid tumour in the lower part of the abdomen, extending two inches above the umbilicus, and four inches to right and left of median line. The swelling has a well-defined outline, and is slightly movable. It is uniformly dull on percussion from the pubes upwards. Both flanks are resonant. In the left iliac fossa can be felt a hard rounded mass like a fœtal head. A somewhat similar mass, not quite so large or so hard, can be felt rather deeper on the right side. The fundus uteri is situated immediately beneath the anterior abdominal wall, its upper border being three inches above the top of the symphysis pubis. The distance from the umbilicus to the anterior superior spine of the right ilium is six inches, that from the same point to the anterior superior spine of the left ilium six and a half inches. There is tenderness only at one spot, just above the crest of the right ilium.

On vaginal examination, the cervix is found high up and flattened behind the symphysis pubis. The os uteri points downwards and backwards. The posterior lip is almost obliterated by the pressure and stretching produced by a hard mass in Douglas's pouch, the lowest part of which

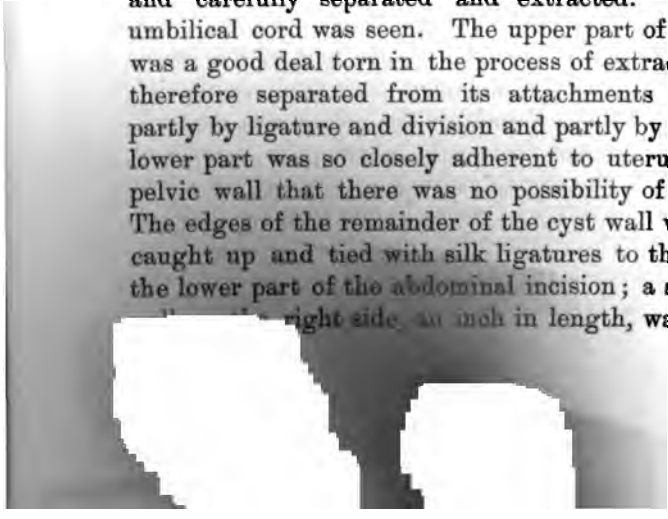
resembles the sharp outline of a fœtal limb flexed. The uterine sound passes four inches into the uterus; the point is distinctly felt through the anterior abdominal wall. The tumour in the abdomen and that in Douglas's pouch are continuous with one another; the least movement of the one being imparted to the other and also to the uterus.

The temperature is normal, and the urine healthy.

The diagnosis of extra-uterine fœtation being almost conclusively established, it was decided that as the fœtus had now been dead for nearly eight months, and the risk of hæmorrhage from the placenta and its site was therefore exceedingly small, the proper treatment was to remove the fœtus and placenta by abdominal section. It was true that there were no symptoms rendering an operation a matter of absolute urgency, but on the other hand the patient in her present condition ran a constant risk of septicæmia, and an operation seemed much more likely to be successful now than if delayed until septicæmia or signs of suppuration in the cyst had actually occurred.

Accordingly, on August 16th, ether being administered by Mr. White, an incision was made in the median line of the abdomen a little below the umbilicus. The uterus was found lying immediately beneath the abdominal wall, the fundus 3½ inches above the top of the pubes. Behind the uterus and rising considerably above it was a tumour, with an outer covering of peritoneum and with the omentum lying in front of it, and here and there adherent to it. The omentum having been pushed upwards to expose the tumour more fully, the left cornu of the uterus was found to be dragged upwards, and the left Fallopian tube was seen to run almost directly upwards for half an inch, when it became expanded to form the upper part of the cyst wall. To the right of and behind the uterus, at its lower part, a knuckle of tubing projected, which afterwards proved to be a portion of the dilated right Fallopian tube. The central portion of the exposed tumour felt soft and elastic as though the placenta were situated immediately beneath its anterior wall. To the left, the wall was thin, and

through it bones could be distinctly felt. To the right, the wall was still thinner and dark almost to blackness. A trocar was pushed in where the wall felt thinnest on the right, but nothing flowed. The trocar was therefore withdrawn, and the opening enlarged so as to admit the finger. The finger passed into spongy tissue, which proved to be the thin edge of the placenta. Tearing through this, the upper arm of the fœtus came into view. The opening was now further enlarged, and it was then discovered that the skin of the fœtus had become intimately adherent to the cyst wall wherever it was in direct contact with it. The placenta was now removed to give more room, a proceeding which was not attended with any hæmorrhage, and a ligature was passed round the left Fallopian tube near the uterus by means of an aneurysm-needle, and the tube divided on the distal side of the ligature. The fœtus was now carefully separated from the cyst wall. Its position was as follows: The back was directed forwards, the head lay towards the left, the breech towards the right, the left arm was lying by the side of the trunk and above it, the right arm passed downwards in the direction of Douglas's pouch, the legs (invisible at this stage of the operation) lay behind, strongly flexed upon the abdomen. First, the left hand and arm were extracted, next the right, and then with much difficulty the head, which was so adherent that portions of the scalp, with hair attached, remained on the cyst wall. The remainder of the fœtus was then slowly and carefully separated and extracted. No trace of umbilical cord was seen. The upper part of the cyst wall was a good deal torn in the process of extraction, and was therefore separated from its attachments and removed, partly by ligature and division and partly by tearing. The lower part was so closely adherent to uterus, bowel, and pelvic wall that there was no possibility of removing it. The edges of the remainder of the cyst wall were therefore caught up and tied with silk ligatures to the two sides of the lower part of the abdominal incision; a slit in the cyst [illegible] right side, an inch in length, was stitched up.



The uterus had meantime dropped into the pelvis; both it and the bladder were uninjured. The right ovary was normal and free from adhesion. The right tube was free, but swollen and tortuous. A glass drainage-tube was passed down by the left side of the uterus, the lower end resting in the peritoneal cavity in front of the left broad ligament, and an india-rubber drainage-tube six and three quarter inches long, was passed into the empty cyst. The upper part of the abdominal incision was closed by means of silkworm-gut sutures.

The operation lasted two hours. Once or twice the patient became alarmingly collapsed, and on one occasion an enema containing brandy was administered.

The wound was dressed with pads of sublimate wood wool, surrounded and covered with absorbent cotton wool, and secured by a many-tailed flannel bandage.

The placenta was like a compressed sponge, out of which blood-stained fluid had recently been squeezed; its tissue was not more easily lacerable than normal placental tissue.

The fœtus, a female, was free from odour; it measured seventeen inches in length, and weighed 2 lbs. 13 oz. There was no umbilical cord visible. There was an opening in the anterior abdominal wall at the umbilicus, exposing the contents of the abdominal cavity. The head had been twisted considerably on the shoulders; the thighs and knees were in extreme flexion; both knees were pointing towards the left side of the fœtus; the feet were bent so that the dorsum of the foot was closely applied to the front of the leg. The skin showed dark-brown discolouration across the angle of the jaw, the upper part of the back, and the upper part of the abdomen, as if from contiguity with coils of intestine; elsewhere the colour was natural. The head was flattened from side to side, the nose level with the forehead, the mouth twisted so that its left angle pointed upwards, making an acute angle with the median line of the face. The eyelids were closed, and the eyeballs shrunk. All the parts that had been in contact with the cyst wall were shreddy or torn, and portions of integument

were missing from the head, and from the fingers of the right hand.

The temperature during the patient's convalescence on no occasion rose higher than 100·4°, and after the fifth day never reached 100°. The glass drainage-tube was removed in forty-four hours, and replaced by one of india-rubber four and a half inches in length. This remained in for two days, and was then removed. Two of the silk sutures uniting cyst-wall to abdominal incision were removed on the fourth day, and the remaining four on the day following. The india-rubber tube inside the cyst was taken out for the first time on the fifth day, and replaced by one two and a quarter inches shorter. On the seventh day, there being no suppuration and no discharge from the tube, the tube was withdrawn, and a much shorter one, only two inches in length, was inserted in its place. The silkworm-gut sutures closing the upper part of the wound were removed at the same time. On the eighth day the patient had a fish dinner, and on the following day the bowels acted for the first time after two small enemata of olive oil. The drainage-tube was finally removed on the tenth day.

On August 27th (the twelfth day) the wound measured $2\frac{1}{8} \times \frac{3}{4}$ inches; at its base there was a small yellow slough, free from odour. There was now a slight purulent discharge without odour.

On September 21st no slough was visible; the wound measured $1 \times \frac{3}{4}$ inches, and was filled with soft granulations. In the meantime two or three ligatures had been discharged, and some hairs from the fœtal scalp. The patient moves about the ward, and feels quite well.

[Three months later the wound had completely healed.]

The fœtus and placenta were shown.

Dr. GRIFFITH asked Dr. Cullingworth if he were able to ascrtain certainly that the fœtal sac was in the broad ligament or not, as Mr. Lawson Tait had recently stated his opinion that no extra-uterine pregnancy was advanced to term or near it except when the sac was subperitoneal. There were many reasons for doubting this, and a specimen in the museum of St.

Bartholomew's Hospital almost certainly disproved it. Dr. Griffith also asked if Dr. Cullingworth found any advantage in the median incision and the opening of the peritoneal cavity, as it had been shown by Mr. Thornton and others that it was usually better to cut down directly on the sac and to avoid opening the peritoneum.

Dr. HERMAN was interested in the condition of the placenta in Dr. Cullingworth's case. It resembled in all important respects the placenta from cases of extra-uterine gestation removed some time after the death of the child, which had been exhibited to this Society by Mr. Knowsley Thornton, Mr. Doran, Dr. Champneys, Dr. Aust Lawrence, and himself. It was altered, made larger and more solid, by the effusion of blood into it, and the partial organisation of that effused blood. This change was accompanied by great diminution in the activity of the circulation through the maternal structures to which the placenta was attached, so that the placenta could be detached and removed with trifling, if any, hæmorrhage. This was a reason why the secondary operation, performed long enough after the death of the child for this change to have taken place, was far less dangerous than operation near full term during the life of the child. If we knew exactly the circumstances under which this change took place, and the length of time needed for its accomplishment, this knowledge would give us most valuable guidance in the selection of the best time for operation. Litzmann ('Arch. für Gyn.,' Band xvi, S. 397) had endeavoured to ascertain the date at which the maternal placental circulation might be expected to have ceased, but had only come to the conclusion that it could not be estimated with certainty. Further observation, therefore, as to the natural history of the placenta after the death of the child was needed, and was very important. He could not agree with Dr. Griffith that in every abdominal gestation that went to term the child was developed under the peritoneum. Many cases had been recorded in which the child was lying in the peritoneal cavity among the bowels, covered only by its own membranes. He had operated on one such case himself, in which the placenta was attached to the bladder and anterior abdominal wall.

Dr. CHAMPNEYS said that the statement that all cases of extra-uterine gestation which went quite or nearly to term were intraligamentous was quite unfounded. In his own case, lately contributed to the 'Transactions' (vol. xxiv for 1887, p. 461), the fœtus was simply free and kicking about among the bowels. Other similar cases were on record. To the President, Dr. Champneys said that furious hæmorrhage had occurred from the placental site four months after the death of the child (Litzmann).

Dr. GALABIN asked what was the relation of the mass described as felt behind the uterus,—whether the peritoneum had been stripped off the back of the uterus by the expanding sac. He thought that there was positive evidence that some of the cases which went on to the full term of pregnancy or nearly so were abdominal and not intraligamentous fœtations. In one case of combined extra-uterine and intra-uterine fœtation in which he had operated, the fœtus was enclosed only in its own thin membranes, and the placenta was attached to the pouch of Douglas and the back of the uterus.

Dr. WILLIAM DUNCAN thought that very many cases of rupture were between the layers of the broad ligament and not into the peritoneal cavity; he mentioned a case of the kind under his care in which he performed laparotomy.

Dr. PLAYFAIR said that no one could question the correctness of the practice adopted by Dr. Cullingworth. At the time the patient was seen by him no other resource but secondary laparotomy was possible, and it had happily proved successful. This was generally considered the safest and best procedure as a matter of choice, and Dr. Herman had referred to it as a rule which was established. He did not think, however, that it should necessarily be so considered. The recent cases of primary operation before the death of the child had lately been tabulated by Dr. Harris, of Philadelphia, and this showed a most gratifying success. It appeared to him very probable that increased knowledge and improved methods of operation would greatly lessen the mortality which had attended the primary operation, and cause it to be much more frequently adopted. He observed that the fœtus in Dr. Cullingworth's case, although some six months had elapsed since its death, was perfectly fresh and unaltered. He had often been struck with the remarkable differences met with in the fœtus in cases of extra-uterine fœtation. Sometimes it remained for a length of time quite unaltered; thus in the Museum of the Royal College of Surgeons was a fœtus which had been retained in the abdomen for something like fifty years, and was as fresh as a newborn child. Again, he had seen the fœtus transformed in a few months into a mass of sticky adipocere, containing loose bones. which was so adhesive as to render its removal from the containing cyst almost impossible. Again, it might become mummified or ossified into the so-called "lithopædion." Possibly some of our pathological Fellows might be able to throw some light on these curious points, a knowledge of which would certainly be of practical utility. It seemed obvious from the history of this case that early in the pregnancy rupture, probably of Fallopian pregnancy, had occurred. This illustrated the fact, now pretty generally recognised, that laceration at an

early period of extra-uterine pregnancy was by no means so necessarily fatal as was generally supposed to be the case, and that it often preceded the development of an abdominal gestation. Of this he had recently seen a curious example in the case of a lady who was suddenly taken ill in the street, and was carried into a neighbouring house in an apparently moribund state. He had been called in to see her, and diagnosed a ruptured Fallopian pregnancy, a diagnosis also made by Dr. Matthews Duncan, who saw the case. Laparotomy was decided on, but before the necessary preparations for the operation could be completed, the patient rallied, and got apparently quite well. Nothing fresh transpired, and in a week or two the lady left England, it being supposed that the original diagnosis was erroneous. He had recently heard, however, that an abdominal tumour had developed, and that the lady was now under the care of Prof. Breisky, of Vienna, who was about to perform laparotomy.

Dr. CULLINGWORTH, in reply, said that he had no doubt that the gestation was originally tubal, that rupture had occurred, permitting the escape of the fœtus into the broad ligament, where it had continued to develop up to the eighth month, and that the illness, described by the patient as having followed a blow on the abdomen received whilst playing with her little boy, in reality marked the occasion when rupture took place. Unfortunately, the patient was unable to remember the precise date of this illness. He could not quite see how it would have been possible to carry out the suggestion of Dr. Griffith and operate without opening the peritoneal cavity. The sac was everywhere invested with peritoneum. This investment had been obtained partly at the expense of the peritoneum covering the lower and posterior part of the uterus, and still more largely by the stripping up of the peritoneum from the pelvic wall. The ease of the operation, and probably its success, were in great measure due to the circulation through the placenta having ceased. A symptom that had been held to be amongst the most constant, and therefore of great value in diagnosis, was absent in this case. He referred to irregular hæmorrhages in the early months. There was entire absence of vaginal discharge throughout the eight months of pregnancy and for some months after the death of the fœtus. Another noticeable point was that no decidual membrane was ever seen. Since the paper was sent in two more ligatures had been discharged, and the wound had now closed. Dr. Playfair had raised a very interesting question, and one that had no doubt exercised the minds of many of the Fellows. It was most difficult to explain why, in some cases, the fœtus remained quiescent for years, doing no harm to the patient beyond the mechanical inconvenience, whilst in others suppura-

tion occurred quickly, and was followed by a train of disasters. He (Dr. Cullingworth) could only account for it by supposing that in the latter class of cases contiguous or adherent coils of intestine became a source of septic infection to the contents of the fœtal sac. He was glad to find the President in accord with him as to the desirability of operating in such cases. Even in the absence of bad symptoms he thought there could be no doubt that a patient with a dead fœtus in her abdomen was living in constant danger, and that an operation, performed *before* a patient became septicæmic was much more likely to prove successful than *after*. He cordially thanked the President and Fellows for the kind manner in which they had received and discussed the paper.

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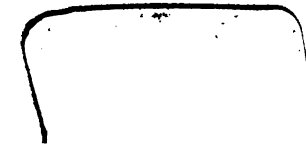

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